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Contents







Product Description

Eaton's new line of ***XT*** Relays and Timers includes mini and standard frame control relays and auxiliary contacts, mini electronic on-delay and multi-function timers and an electronic star-delta (wye-delta) timer for use in star-delta (wye-delta) combinations. Because ***XT*** meets UL, CSA, CCC and CE standards, it is the perfect product solution for IEC applications all over the world. The compact, space saving, and easy to install ***XT*** line of IEC contactors and starters is the efficient and effective solution for customer applications.

Features

- For use with Mini and Standard frame size contactors and starters
- Control Relays
  - AC Control from 12V to 550V 50 Hz, 600V 60 Hz
  - DC Control from 12V to 220V
- On-Delay and Multi-Function Timers
  - 24 – 240V AC/DC Control
- Available with screw or spring cage terminals
- 4-Pole Configurations
- IP20 finger and back-of-hand proof
- Large ambient temperature range: -25° to 50°C [-13° to 122°F]
- The XTRE Control Relays have positively driven contacts between the relay and the auxiliary contact modules as well as within the auxiliary contact modules

Standards and Certifications

- IEC EN 60947
- CE Approved
- UL
- CSA
- CCC
- ATEX

Instructional Leaflets

Pub51219	Inside of Packaging XTRM Mini Control Relays
Pub51210	Inside of Packaging 7-15A XTCE Contactors and XTRE Control Relays
Pub51244	XTTR Electronic Star-Delta (Wye-Delta) Timer
Pub51245	XTMT Mini Electronic On-Delay and Multi-Function Timers

Catalog Number Selection

Table 34-1. *XT* — Relay Catalog Numbering System

XT RE C 10 B 22 AD

Product Line Prefix
XT = ***XT*** IEC Power Control

Product Family Code
RM = Mini IEC Control Relay
RE = IEC Control Relay

Terminations
Blank = Screw Terminals
C = Spring Cage Terminals

Conventional Thermal Current Rating
10 = 10A

Frame
For XTRM
A = 45 mm — Mini
For XTRE
B = 45 mm — Standard

Contact Configuration
40 = 4NO
31 = 3NO-1NC
22 = 2NO-2NC

Coil Code
See **Table 34-5** on **Page 34-4**.

Table 34-2. *XT* — Timers Catalog Numbering System

XT MT 6 B 30S 11 B

Product Line Prefix
XT = ***XT*** IEC Power Control

Product Family Code
MT = Mini IEC Timing Relay
TR = Electronic Timing Relay Star-Delta (Wye-Delta)

Conventional Thermal Current Rating
6 = 6A

Frame
A = 45 mm

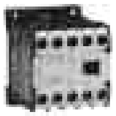
Time Range Max.
For XTMT
30S = 1.5 – 30 s
60H = 0.05 – 1 s
0.15 – 3 s
0.5 – 10 s
3 – 60 s
0.15 – 3 min
0.5 – 3 min
3 – 60 min
0.15 – 3 h
0.5 – 3 h
3 – 60 h
For XTTR
60S = 3 – 60 s

Function
For XTMT
11 = On-Delay
70 = Adjustable
For XTTR
51 = Star-Delta

Coil Code
B = 24 – 240V AC/DC

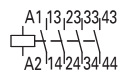
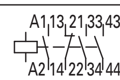
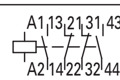
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Product Selection



Mini Control Relays

Table 34-3. Mini Control Relays

Conventional Thermal Current I_{th} (A)	Contact Configuration	Rated Operational Current AC-15 I_e (A)			Circuit Symbol	Screw Terminals	Spring Cage Terminals	Price U.S. $	
		220 – 240V	380 – 415V	500V		Catalog Number ①	Catalog Number ①	AC Coil	DC Coil
10	4NO	6	3	1.5		**XTRM10A40_**	**XTRMC10A40_**		
10	3NO-1NC	6	3	1.5		**XTRM10A31_**	**XTRMC10A31_**		
10	2NO-2NC	6	3	1.5		**XTRM10A22_**	**XTRMC10A22_**		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-5**.

Control Relays

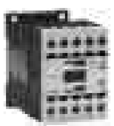
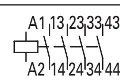
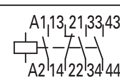
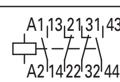


Table 34-4. Control Relays

Conventional Thermal Current Open at 60°C I_{th} (A)	Contact Configuration	Rated Operational Current AC-15 I_e (A)			Circuit Symbol	Screw Terminals	Spring Cage Terminals	Price U.S. $	
		220 – 240V	380 – 415V	500V		Catalog Number ②	Catalog Number ②	AC Coil	DC Coil
16	4NO	6	4	1.5		**XTRE10B40_**	**XTREC10B40_**		
16	3NO-1NC	6	4	1.5		**XTRE10B31_**	**XTREC10B31_**		
16	2NO-2NC	6	4	1.5		**XTRE10B22_** ③	**XTREC10B22_** ③		

② Underscore (_) indicates magnet coil suffix required. See **Table 34-5**.
③ DC operated control relays XTRE(C)10B22_ can only be combined with 2-pole auxiliary contacts.

Table 34-5. Coil Voltage Suffix

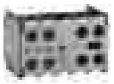
Coil Voltage	Suffix Code	Coil Voltage	Suffix Code	Coil Voltage	Suffix Code
110V 50 Hz, 120V 60 Hz	**A**	208V 60 Hz	**E**	24V 50 Hz	**U**
220V 50 Hz, 240V 60 Hz	**B**	190V 50 Hz, 220V 60 Hz	**G**	42V 50 Hz, 48V 60 Hz	**W**
230V 50 Hz	**F**	240V 50 Hz, 277V 60 Hz	**H**	48V 50 Hz	**Y**
24V 50/60 Hz	**T**	380V 50 Hz, 440V 60 Hz	**L**	120V DC	**AD**
24V DC	**TD**	400V 50 Hz	**N**	220V DC	**BD**
415V 50 Hz, 480V 60 Hz	**C**	380V 60 Hz	**P**	12V DC	**RD**
550V 50 Hz, 600V 60 Hz	**D**	12V 50/60 Hz	**R**	48V DC	**WD**

Notes:

- Orders must be placed in multiples of the package quantity listed.
- DC operated control relays have a built-in suppressor circuit.
- Contact terminal numbers to EN50011.
- Coil terminal numbers to EN50005.

Accessories .... **Page 34-5**
Dimensions .... **Page 34-13**
Discount Symbol **1CD7**

Accessories



Auxiliary Contacts

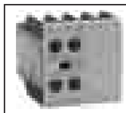
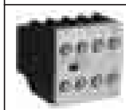
Table 34-6. Front Mount Auxiliary Contacts for Use with XTRM Mini Control Relays

Conventional thermal current, I_{th} Open (A)	Rated Operational Current AC-15 I_e (A)			Contact Configuration	Contact Sequence	Package Qty.	Screw Terminals	Spring Cage Terminals	Price U.S. $ ①
	220V 230V 240V	380V 400V 415V	500V				Catalog Number	Catalog Number	
10	4	2	1.5	2NC	51 61 / 52 62	5	**XTMCXFA02**	—	
10	4	2	1.5	1NO-1NC	53 61 / 54 62	5	**XTMCXFA11**	**XTMCXFAC11**	
10	4	2	1.5	2NO	53 63 / 54 64	5	**XTMCXFA20**	—	
10	4	2	1.5	$1NO_E$-$1NC_L$	57 65 / 58 66	5	**XTMCXFAL11** ②	—	
10	4	2	1.5	4NC	51 61 71 81 / 52 62 72 82	5	**XTMCXFA04**	**XTMCXFAC04**	
10	4	2	1.5	1NO-3NC	53 61 71 81 / 54 62 72 82	5	**XTMCXFA13**	**XTMCXFAC13**	
10	4	2	1.5	2NO-2NC	53 61 71 83 / 54 62 72 84	5	**XTMCXFA22**	**XTMCXFAC22**	
10	4	2	1.5	3NO-1NC	53 61 73 83 / 54 62 74 84	5	**XTMCXFA31**	**XTMCXFAC31**	
10	4	2	1.5	4NO	53 63 73 83 / 54 64 74 84	5	**XTMCXFA40**	**XTMCXFAC40**	
10	4	2	1.5	1NO-1NC $1NO_E$-$1NC_L$	57 65 71 83 / 58 66 72 84	5	**XTMCXFAL22** ②	**XTMCXFCLC22** ②	

① Orders must be placed in multiples of package quantity listed.
② 1 early-make contact (NO_E), 1 late-break contact (NC_L).

Discount Symbol **1CD7**

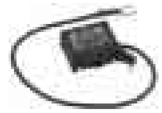
Table 34-7. Front Mount Auxiliary Contacts for Use with XTRE Control Relays ③

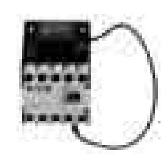
	Conventional Thermal Current, I_{th} (A), Open at 60°C	Poles	Rated Operational Current AC-15 I_e (A) 220V 230V 240V	380V 400V 415V	500V	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price U.S. $ ①
	16	2	6	3	1.5	2NO	53 63 / 54 64	5	XTCEXFAC20	XTCEXFACC20	
	16	2	6	3	1.5	1NO-1NC	53 61 / 54 62	5	XTCEXFAC11	XTCEXFACC11	
	16	2	6	3	1.5	2NC	51 61 / 52 62	5	XTCEXFAC02	XTCEXFACC02	
	16	2	6	3	1.5	$1NO_E$-$1NC_L$	57 65 / 58 66	5	XTCEXFALC11 ②	XTCEXFALCC11 ②	
	16	4	6	3	1.5	4NO	53 63 73 83 / 54 64 74 84	5	XTCEXFAC40	XTCEXFACC40	
	16	4	6	3	1.5	3NO-1NC	53 61 73 83 / 54 62 74 84	5	XTCEXFAC31	XTCEXFACC31	
	16	4	6	3	1.5	2NO-2NC	53 61 71 83 / 54 62 72 84	5	XTCEXFAC22	XTCEXFACC22	
	16	4	6	3	1.5	1NO-3NC	53 61 71 81 / 54 62 72 82	5	XTCEXFAC13	XTCEXFACC13	
	16	4	6	3	1.5	4NC	51 61 71 81 / 52 62 72 82	5	XTCEXFAC04	XTCEXFACC04	
	16	4	6	3	1.5	1NO-1NC $1NO_E$-$1NC_L$	57 65 71 83 / 58 66 72 84	5	XTCEXFCLC22 ②	XTCEXFCLCC22 ②	

① Orders must be placed in multiples of package quantity listed.
② 1 early-make contact (NO_E), 1 late-break contact (NC_L).
③ Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO_E and NC_L contacts) and between the auxiliary contacts and built-in contacts of the XTRE control relays.

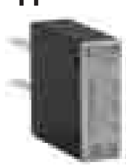
Suppressors

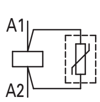
For AC operated contactors 50 – 60 Hz. On DC operated contactor relays and on XTRE10B the suppressor circuit is built-in. Note drop-out relay.





Varistor Suppressor ④⑤





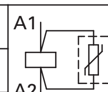
Contact Sequence

Table 34-8. Varistor Suppressor for XTRE

Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑥
24 – 48 48 – 130 130 – 240 240 – 500	XTCE007B – XTCE015B, XTCF020B, XTRE(C)10B	10 10 10 10	XTCEXVSBW XTCEXVSBA XTCEXVSBB XTCEXVSBC	

④ Note drop-out delay.
⑤ For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
⑥ Orders must be placed in multiples of package quantity listed.

Table 34-9. Varistor Suppressor for XTRM ⑦

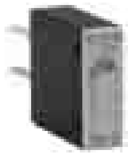
Voltage	For Use with…	Circuit Symbol	Package Qty.	Catalog Number	Price U.S. $ ⑧
24 – 48	XTRM6A…, XTRM9A…	 A1 A2	10	XTMCXVSW	
48 – 130	XTRM6A…, XTRM9A…		10	XTMCXVSA	
110 – 250	XTRM6A…, XTRM9A…		10	XTMCXVSB	
380 – 415	XTRM6A…, XTRM9A…		10	XTMCXVSN	
24 – 48	XTRMC6A…, XTRMC9A…		10	XTMCXVSCW	
48 – 130	XTRMC6A…, XTRMC9A…		10	XTMCXVSCA	
110 – 250	XTRMC6A…, XTRMC9A…		10	XTMCXVSCB	

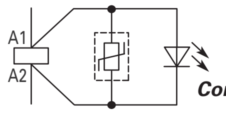
⑦ For AC operated contactors, 50/60 Hz. DC operated contactors have integrated varistor suppressors.
⑧ Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

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Varistor Suppressor with Integrated LED ①②





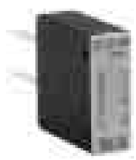
Contact Sequence

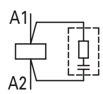
Table 34-10. Varistor Suppressor for XTRE

Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ③
24 – 48 130 – 240	XTRE(C)10B	10 10	**XTCEXVSLBW** **XTCEXVSLBB**	

① Note drop-out delay.
② For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
③ Orders must be placed in multiples of package quantity listed.

RC Suppressor ④⑤





Contact Sequence

Table 34-11. RC Suppressor for XTRE

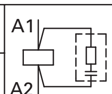
Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑥
24 – 48 48 – 130 110 – 240 240 – 500	XTRE(C)10B	10 10 10 10	**XTCEXRSBW** **XTCEXRSBA** **XTCEXRSBB** **XTCEXRSBC**	

④ Note drop-out delay.
⑤ For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
⑥ Orders must be placed in multiples of package quantity listed.





Table 34-12. RC Suppressor for XTRM ⑦

Voltage	For Use with…	Circuit Symbol	Package Qty.	Catalog Number	Price U.S. $ ⑧
24 – 48	XTRM6A…, XTRM9A…		10	**XTMCXRSW**	
48 – 130	XTRM6A…, XTRM9A…		10	**XTMCXRSA**	
110 – 250	XTRM6A…, XTRM9A…		10	**XTMCXRSB**	
24 – 48	XTRMC6A…, XTRMC9A…		10	**XTMCXRSCW**	
48 – 130	XTRMC6A…, XTRMC9A…		10	**XTMCXRSCA**	
110 – 250	XTRMC6A…, XTRMC9A…		10	**XTMCXRSCB**	

⑦ For AC operated contactors, 50/60 Hz. Note drop-out delay.
⑧ Orders must be placed in multiples of package quantity listed.

Free-Wheel Diode Suppressor



In addition to the built-in suppressor circuit for DC actuated contactors. Prevents negative breaking voltage when contactors are used in combination with a safety PLC.

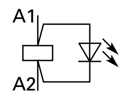
Table 34-13. Free-Wheel Diode Suppressor for XTRE

Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑨
12 – 250 DC	XTRE10B	10	**XTCEXD5B**	

⑨ Orders must be placed in multiples of package quantity listed.

Voltage Indicator





Contact Sequence

Table 34-14. Voltage Indicator for XTRE

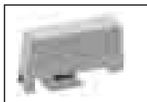
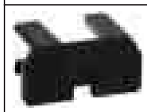
Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑩
24 – 48 110 – 120 110 – 250	XTRE(C)10B	10 10 10	**XTCEXVIBW** **XTCEXVIBA** **XTCEXVIBB**	

⑩ Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

Connector ①

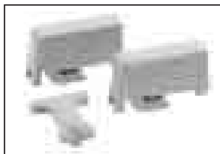
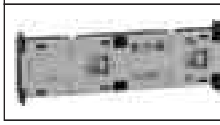
Table 34-15. Connector

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ②
	XTRE(C)10B	50	**XTCEXCNC**	
	XTRM10A	50	**XTMCXCN**	

① For mechanically arranging contactors in combinations. Distance between contactors is 0 mm.
② Orders must be placed in multiples of package quantity listed.

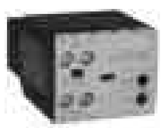
Mechanical Interlock ③

Table 34-16. Mechanical Interlock

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ④
	XTRE10B…	5	**XTCEXMLB**	
	XTRM10A…	5	**XTMCXML**	

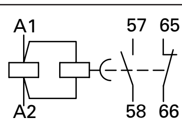
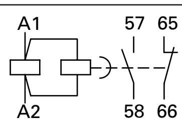
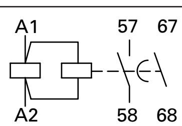
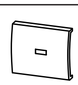
③ For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B frame, mechanical lifespan is 2.5 x 10^6 operations and the distance between contactors is 0 mm.
④ Orders must be placed in multiples of package quantity listed.

Electronic Timer Modules



Front (Top) mounted timer modules for use with XTRE10B control relays. Can not be combined with top mount auxiliary contacts, XTCEXF_C_.

Table 34-17. Electronic Timer Modules for XTRE

Voltage	Contact Sequence	Timing Range	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
On-Delayed						
24V AC/DC		0.05 – 1 s 0.5 – 10 s 15 – 100 s	XTRE10B_	1	**XTCEXTEEC11T**	
100 – 130V AC					**XTCEXTEEC11A**	
200 – 240V AC					**XTCEXTEEC11B**	
Off-Delayed						
24V AC/DC		0.05 – 1 s	XTRE10B_	1	**XTCEXTED1C11T**	
100 – 130V AC					**XTCEXTED1C11A**	
200 – 240V AC					**XTCEXTED1C11B**	
24V AC/DC		0.5 – 10 s	XTRE10B_	1	**XTCEXTED10C11T**	
100 – 130V AC					**XTCEXTED10C11A**	
200 – 240V AC					**XTCEXTED10C11B**	
24V AC/DC		5 – 100 s	XTRE10B_	1	**XTCEXTED100C11T**	
100 – 130V AC					**XTCEXTED100C11A**	
200 – 240V AC					**XTCEXTED100C11B**	
Star-Delta						
24V AC/DC		1 – 30 s	XTRE10B_	1	**XTCEXTEYC20T**	
100 – 130V AC					**XTCEXTEYC20A**	
200 – 240V AC					**XTCEXTEYC20B**	
Sealable Shroud						
	Transparent sealable shroud used to protect electronic timer modules from unwanted access.		XTCEXTEE, XTCEXTED, XTCEXTEY	1	**XTCEXTESHRD**	

Discount Symbol **1CD7**

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Mini Electronic Timers

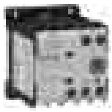
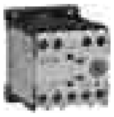
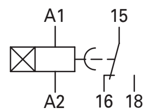
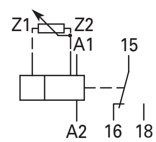
 

Table 34-18. Mini Electronic On-Delay Timers

Conventional Thermal Current I_e (A)	Rated Operational Current I_e AC-11 Amps		Time Range	Function	Terminal Marking According to EN 50042	Catalog Number	Price U.S. $
	220/230/240V	380/400/440V					
6	3	3	1.5 – 30 sec	Fixed, On-delay		**XTMT6A30S11B**	
6	3	6	0.05 – 1 sec 0.15 – 3 sec 0.5 – 10 sec 3 – 60 sec 0.15 – 3 min 0.5 – 10 min 3 – 60 min 0.15 – 3 h 0.5 – 10 h 3 – 60 h	Fixed, On-delay		**XTMT6A60H11B**	
6	3	3	0.05 – 1 sec 0.15 – 3 sec 0.5 – 10 sec 3 – 60 sec 0.15 – 3 min 0.5 – 10 min 3 – 60 min 0.15 – 3 h 0.5 – 10 h 3 – 60 h	Adjustable: On-delayed; Fleeting contact on energization; Flashing; Pulse generating; ON-OFF		**XTMT6A60H70B**	

Notes —

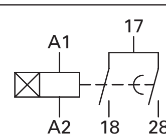
Actuating Voltage
24 – 240 50/60 Hz
24 – 240V DC

Admissible Cable Length	**Connection to**
Cable unscreened, with cable cross-section 0.5 – 1.5 mm^2	Y1/Y2, Z1/Z2
Two-core cable	M250
Two-core cable in the same cable duct with the main cable, 50/60 Hz	M50

Electronic Star-Delta (Wye-Delta) Timers



Table 34-19. Electronic Star-Delta (Wye-Delta) Timers

Conventional Thermal Current I_e (A)	Rated Operational Current I_e AC-11 Amps		Time Range	Function	Terminal Marking According to EN 50042	Catalog Number	Price U.S. $
	230V	400V					
6	3	3	3 – 60 sec	Fixed, Star-Delta		**XTTR6A60S51B**	

Notes —

Actuating Voltage
24 – 240 50/60 Hz
24 – 240V DC

Admissible Cable Length	**Connection to**
Cable unscreened, with cable cross-section 0.5 – 1.5 mm^2	B1, Z1/Z2
Two-core cable	M250
Two-core cable in the same cable duct with the main cable, 50/60 Hz	M50

Discount Symbol **1CD7**

Technical Data and Specifications

Table 34-20. Relays and Timers — Technical Data and Specifications

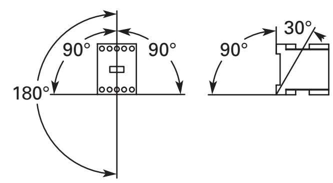
Description	XTRE	XTCEXFAC_	XTCEXTE_	XTRM	XTMCXFA_
General					
Standards	IEC/EN 60947, VDE 0660, UL, CSA		DIN EN 61812, IEC/EN 60947, VDE 060, UL, CSA	IEC/EN 60947, VDE 0660, UL, CSA	
Lifespan, Mechanical AC Operated DC Operated	 20,000,000 20,000,000	 10,000,000 10,000,000	 3,000,000 3,000,000	 10,000,000 20,000,000	 10,000,000 20,000,000
Maximum operating frequency (ops/hr)	9000	9000	—	9000	9000
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30				
Ambient Temperature Open (°C, min/max) Enclosed (°C, min/max) Ambient Temperature for Storage (°C, min/max)	 -25/60 -25/40 -40/80	 -25/60 -25/40 -40/80	 -40/80 -25 – 60 -25 – 40	 -25/50 -25/40 —	 -25/50 -25/40 —
Mounting Position			As required, not suspended	As required, except vertically A1/A2 at the bottom	
Mechanical shock resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 ms Base unit with auxiliary contact module Make contact Break contact	 7g 5g	 7g 5g	 6g 6g	 10g 8g	 10g 8g
Degree of Protection	IP20	IP20	IP20	IP20	IP20
Protection against direct contact from the front when actuated by a perpendicular test finger (IEC 536)	Finger- and back-of-hand proof				
Weight AC operated (kg) DC operated (kg)	 0.23 0.28	 0.05 0.05	 0.08 0.08	 0.17 0.20	 — —
Terminal capacity Screw terminals Solid (mm^2) Flexible with ferrule (mm^2) Solid or stranded (AWG)	 1 x (0.75 – 4) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 18 – 14		 1 x (0.75 – 2.5) 2 x (0.75 – 1.5) 1 x (0.75 – 1.5) 2 x (0.75 – 1.5) 18 – 14	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 1.5) 2 x (0.75 – 1.5) 18 – 14	
Terminal screw	M3.5	M3.5	M3.5	M3.5	M3.5
Pozidriv screwdriver	Size 2	Size 2	Size 2	Size 2	Size 2
Standard screwdriver (mm)	0.8 x 5.5 1 x 6		0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	
Max. tightening torque (Nm)	1.2	1.2	1.2	1.2	1.2
Spring cage terminals Solid (mm^2) Flexible with or without ferrule DIN 46228 (mm^2) Solid or stranded (AWG)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 18 – 14		 — — — — —	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 18 – 14	
Standard screwdriver (mm)	0.6 x 3.5		—	0.6 x 3.5	
Contacts					
Interlocked opposing contacts to ZH 1/457, including auxiliary contact module	Yes	Yes	No	Yes	Yes
Rated impulse withstand voltage (U_{imp}) V AC	6000	6000	6000	6000	6000
Overvoltage category/pollution degree	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage (U_i) V AC	690	690	600	690	690
Rated operational voltage (U_e) V AC	690	500	400	600	600
Safe isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and auxiliary contacts (V AC) Between the auxiliary contacts (V AC)	 400 400	 400 400	 250 250	 300 300	 300 300
Rated operational current AC-15 220/240V I_e 380/415V I_e 500V I_e	 6 4 1.5	 6 3 —	 Please inquire Please inquire —	 6 3 1.5	 4 2 1.5

Table 34-20. Relays and Timers — Technical Data and Specifications (Continued)

Description	XTRE	XTCEXFAC_	XTCEXTE_	XTRM	XTMCXFA_
Contacts (Continued)					
DC-13 ①					
DC13 L/R ≤ 15 mS					
Contacts in series: 1, Voltage: 24V	10	10	—	2.5	2.5
1, 60V	6	6	—	—	—
2, 60V	10	10	—	2.5	2.5
1, 110V	3	3	—	—	—
3, 110V	6	6	—	1.5	1.5
1, 220V	1	1	—	—	—
3, 220V	5	5	—	0.5	0.5
DC-13 L/R ≤ 50 mS					
Contacts in series: 3, Voltage: 24V	4	—	—	—	—
3, 60V	4	—	—	—	—
3, 110V	2	—	—	—	—
3, 220V	1	—	—	—	—
Control circuit reliability (at U_e = 24V DC, U_{min} = 17, I_{min} = 5.4 mA)	Failure rate = <10^{-8}, < one failure in 100 million operations		—	Failure rate = <10^{-8}, < one failure in 100 million operations	
Conventional thermal current (I_{th})	16	16	6	10	10
Short-circuit rating without welding					
Maximum overcurrent protective device					
220/240V – XTPR Frame B	4	—	—	4	4
380/415V – XTPR Frame B	4	—	—	4	4
Short-circuit protection, max. fuse					
500V (A gG/gL)	10	10	6	6	6
500V (A fast)	—	—	—	10	10
Current heat losses at load of I_{th}					
AC operated (W)	0.3	0.3	—	0.2	0.2
DC operated (W)	0.3	0.3	—	0.3	0.3
Magnet Systems					
Pick-up and drop-out values					
AC operated					
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz (Pick-up x U_c)	0.8 – 1.1	—	0.85 – 11	0.8 – 1.1	—
Dual-frequency coil 50/60 Hz (Pick-up x U_c)	0.8 – 1.1	—	—	0.85 – 1.1	—
DC operated ②					
Pick -up voltage (Pick-up x U_c)	0.8 – 1.1	—	0.7 – 1.2	0.85 – 1.3	—
At 24V: without auxiliary contact module (40°C) (Pick-up x U_c)	0.7 – 1.3	—	—	0.7 – 1.3	—
Power consumption					
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz					
Pick-up VA	24	—	—	25	—
Pick-up W	19	—	—	22	—
Sealing VA	3.4	—	2	4.6	—
Sealing W	1.2	—	1.8	1.3	—
Dual-frequency coil 50/60 Hz at 50 Hz					
Pick-up VA	27	—	—	30	—
Pick-up W	22	—	—	26	—
Sealing VA	4.2	—	—	5.4	—
Sealing W	1.4	—	—	1.6	—
Dual-frequency coil 50/60 Hz at 60 Hz					
Pick-up VA	25	—	—	29	—
Pick-up W	21	—	—	24	—
Sealing VA	3.3	—	—	3.9	—
Sealing W	1.2	—	—	1.2	—
DC operated					
Pull-in = sealing (W)	3	—	—	2.6	—
Duty factor (% DF)	100	—	100	100	—
Switching times at 100% U_c (approximate values)					
AC operated closing delay (mS)	≤21	—	—	14 – 21	—
AC operated NO contact opening delay (mS)	≤18	—	—	8 – 18	—
AC operated with auxiliary contact module, max. closing delay (mS)	—	—	—	45	45
DC operated closing delay (mS)	≤31	—	—	26 – 35	—
DC operated NO contact opening delay (mS)	≤12	—	—	15 – 25	—
DC operated with auxiliary contact module, max. closing delay (mS)	—	—	—	70	70

① Making and breaking conditions to DC13, time constant as stated.
② Smoothed DC or three-phase bridge rectifier.

Control Relays

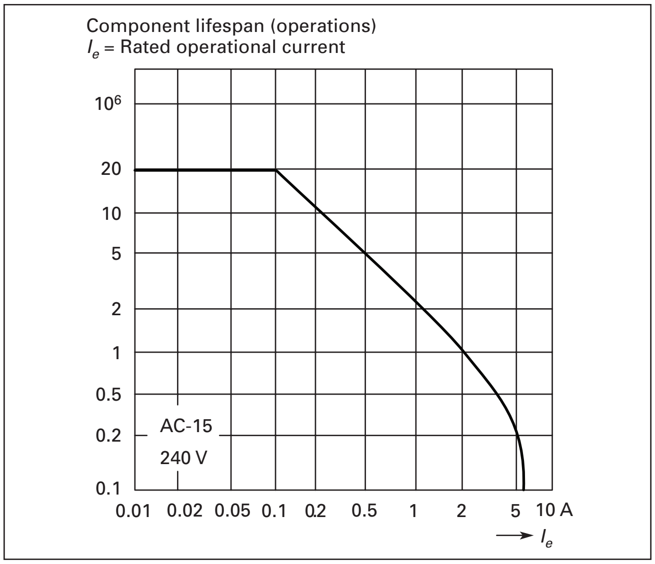


Figure 34-1. XTRE (AC-15) Characteristic Curve

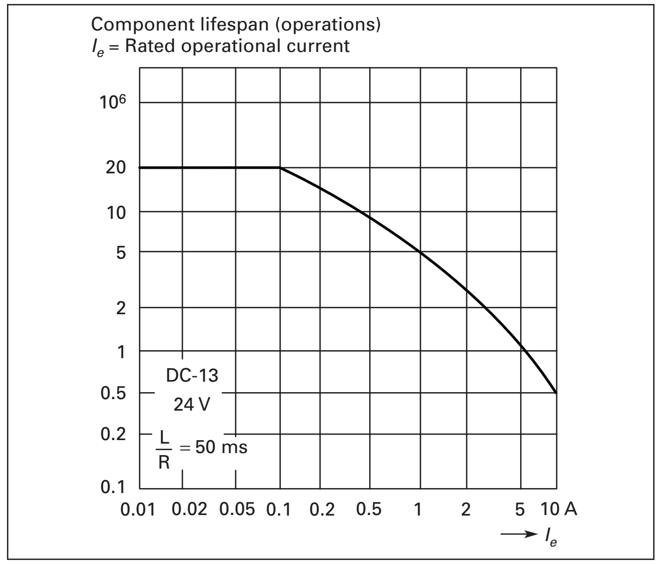


Figure 34-2. XTRE (DC-13) Characteristic Curve ①

① Making and breaking conditions to DC-13, time constant as stated.

The diagrams show the closing and opening travel of the contact of the contactor relays and auxiliary contacts at no load. Tolerances are not taken into consideration.

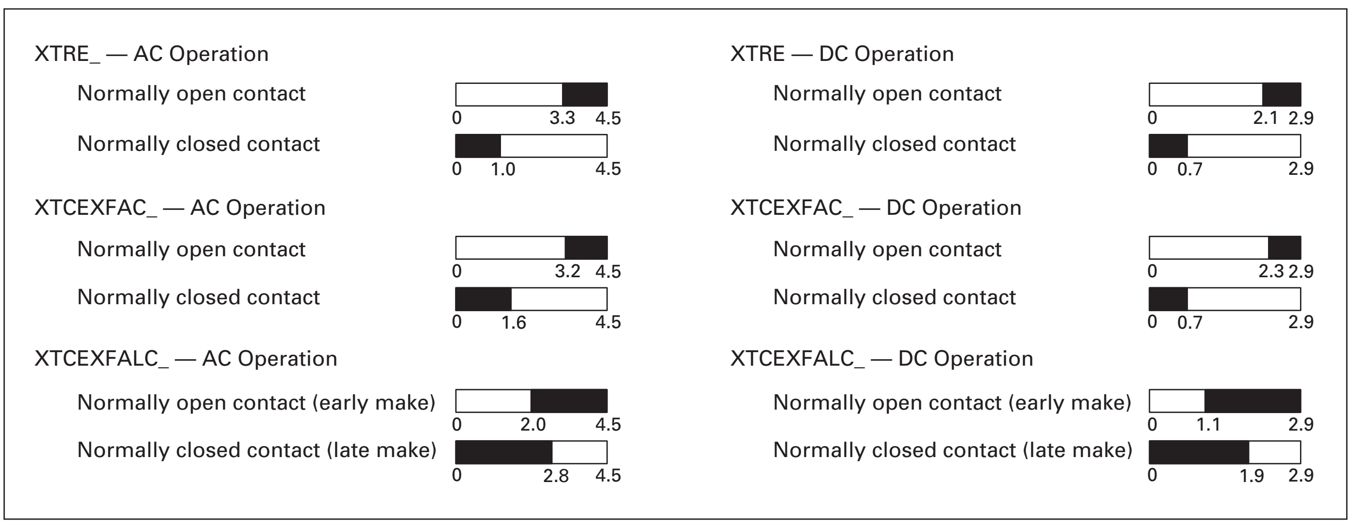


Figure 34-3. Contact Travel Diagrams — XTRE

Flow Diagrams — Electronic Timers

XTMT Mini Timers

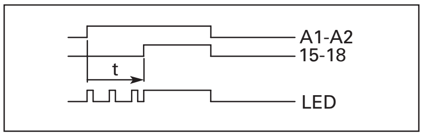


Figure 34-4. On-Delayed

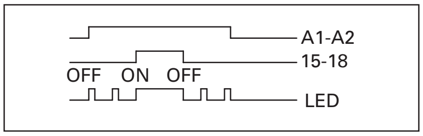


Figure 34-5. ON-OFF Function

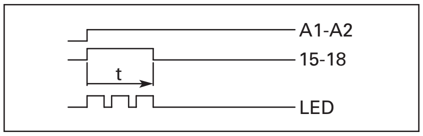


Figure 34-6. Fleeting Contact on Energization

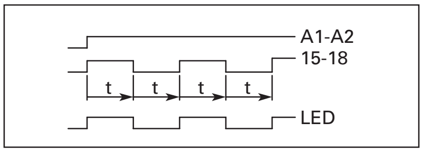


Figure 34-7. Flashing, Pulse Initiating

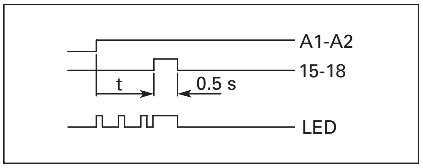


Figure 34-8. Pulse Generating

Star-Delta (Wye-Delta) Timer

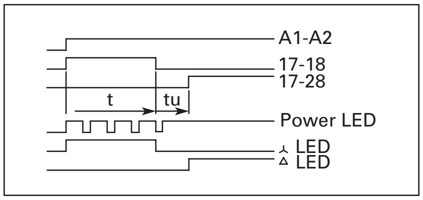


Figure 34-9. Star-Delta

Rating Data

Table 34-21. Rating Data for Approved Types

Pilot Duty	General Use
Control Relays — XTMR	
A600, P300	10A – 600V AC 0.5A – 250V DC
Timers — XTMT, XTTR	
B300	6A – 250V AC

Dimensions

Mini Contactor Relays

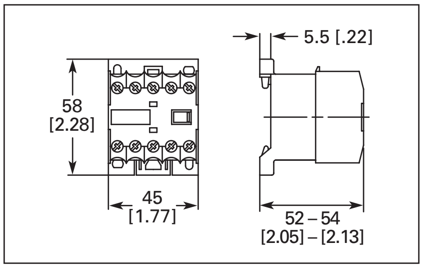


Figure 34-10. Mini Control Relay XTRM — Approximate Dimensions in mm [in.]

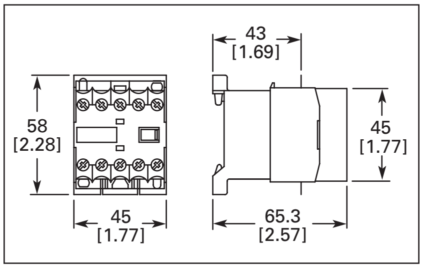


Figure 34-11. XTRM Mini Control Relay with IP40 XTMCX Shroud — Approximate Dimensions in mm [in.]

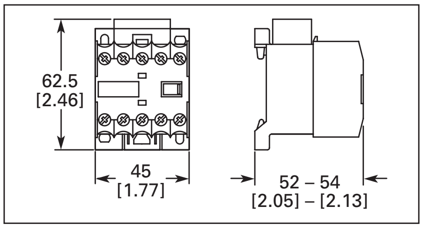


Figure 34-12. XTRM Mini Control Relay with RC or Varistor Suppressor — Approximate Dimensions in mm [in.]

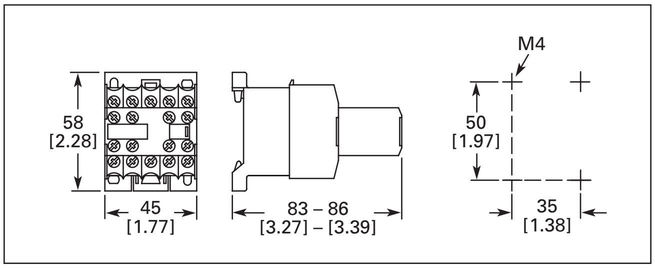


Figure 34-13. XTRM Mini Control Relay with XTMCXFA Auxiliary Contact — Approximate Dimensions in mm [in.]

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Control Relays

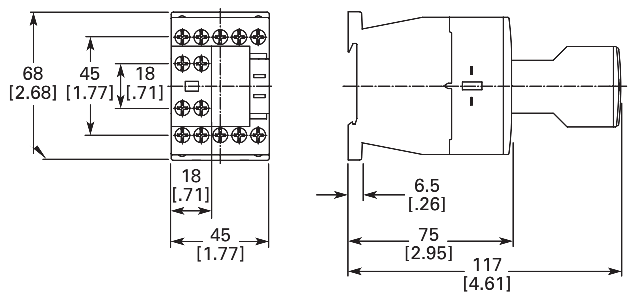


Figure 34-14. Control Relay XTRE with XTCEXFA Auxiliary Contact — Approximate Dimensions in mm [in.]

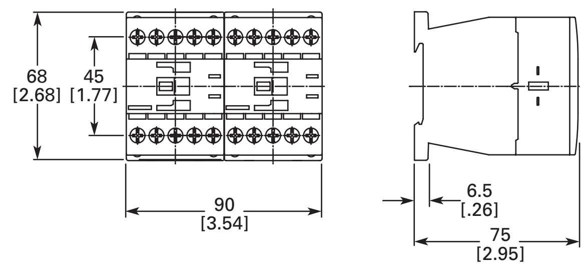


Figure 34-17. Control Relays XTRE with XTCEXMLB Mechanical Interlock — Approximate Dimensions in mm [in.]

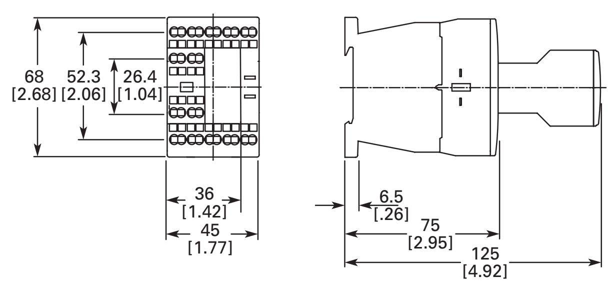


Figure 34-15. Control Relay with Spring Cage Terminals XTREC with XTCEXFA Auxiliary Contact — Approximate Dimensions in mm [in.]

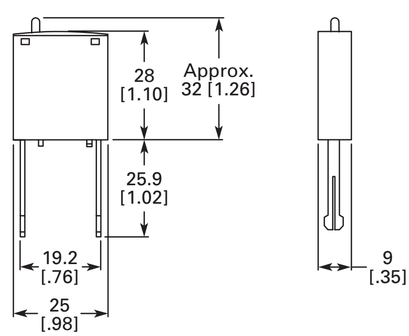


Figure 34-18. Coil Suppressors for Use with XTRE Control Relays — Approximate Dimensions in mm [in.]

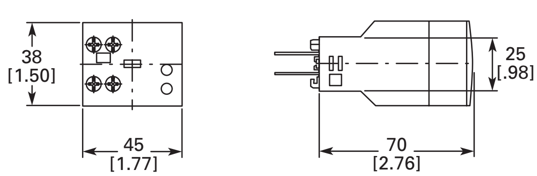


Figure 34-16. Electronic Timer Module XTCEXTE — Approximate Dimensions in mm [in.]

Contents



XTMC Mini Contactor

Product Description

Eaton's new line of Cutler-Hammer® ***XT*** Miniature Controls includes non-reversing and reversing mini contactors, mini overload relays and snap-on accessories. A wide range of applications is possible including small electrical motors from fractional to 5 hp (460V AC) or up to 4 kW (400V AC).

Application Description

Due to its compact size, the ***XT*** line of mini controls is best suited to be applied in light duty loads such as hoisting, packaging, material handling, heating, lighting and automation systems. ***XT*** mini contactors are a particularly compact, economic and environmentally friendly solution wherever control of small motors or loads is required.

Features

Mini Contactors — Types XTMC and XTMF, 6 – 9A

- AC Control from 12V to 550V 50 Hz, 600V 60 Hz
- DC Control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or Non-reversing
- 3 and 4-Pole Configurations
  - 3-Pole XTMC
  - 4-Pole XTMF
- Panel or DIN rail mounting
- IP20 finger and back-of-hand proof
- Low noise operation
- High degree of climatic proofing
- Large ambient temperature range -25° to 50°C [-13° to 122°F]

Mini Overload Relays — Bimetallic Type XTOM

- Phase failure sensitivity
- Direct mount to XTMC and XTMF Mini Contactors
- Trip Class 10
- 11 settings to cover 0.1 to 12A
- Ambient temperature compensated -5° to 50°C [23° to 122°F]
- Manual and automatic reset by selector switch
- 1 Make (NO) or 1 Break (NC) auxiliary contact as standard
- Test/Off Button
- Trip-free release

Standards and Certifications

- IEC EN 60947
- CE Approved
- UL
- CSA
- ATEX
- CCC

Instructional Leaflets

Pub51219	Inside of Packaging
	XTMC, XTMF Mini Contactors, XTRM Mini Control Relay and Accessories
Pub51243	Inside of Packaging
	XTOM Mini Overload Relays
Pub51206	Mini Reversing Link Kits
MN03402002E	XTOM Mini Overload Relays Installation and User Manual

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Catalog Number Selection

Table 34-22. *XT* IEC Miniature Contactors — Catalog Numbering System

XT MC C 6 A 10 A

Designation	
XT = *XT* IEC Power Control	

Type	
MC =	3-Pole FVNR Mini IEC Contactor
MF =	4-Pole FVNR Mini IEC Contactor
MR =	3-Pole FVR Mini IEC Contactor

Terminations	
Blank =	Screw Terminals
C =	Spring Cage Terminals

Current Rating, AC-3	
XTMC	
6 =	6.6A
9 =	8.8A
XTMF	
9 =	8.8A

Frame Size	
A =	45 mm Mini

Integral Auxiliary Contact	
01 =	1NC
10 =	1NO

Coil Codes			
A =	110V 50 Hz, 120V 60 Hz	**N** =	400V 50 Hz
B =	220V 50 Hz, 240V 60 Hz	**P** =	380V 60 Hz
F =	230V 50 Hz	**R** =	12V 50/60 Hz
T =	24V 50/60 Hz	**U** =	24V 50 Hz
TD =	24V DC	**W** =	42V 50 Hz, 48V 60 Hz
C =	415V 50 Hz, 480V 60 Hz	**Y** =	48V 50 Hz
D =	550V 50 Hz, 600V 60 Hz	**AD** =	120V DC
E =	208V 60 Hz	**BD** =	220V DC
G =	190V 50 Hz, 220V 60 Hz	**RD** =	12V DC
H =	240V 50 Hz, 277V 60 Hz	**WD** =	48V DC
L =	380V 50 Hz, 440V 60 Hz		

Table 34-23. *XT* IEC Miniature Overload Relays — Catalog Numbering System

XT OM P16 A C1

Designation	
XT = *XT* IEC Power Control	

Type	
OM =	Mini Overload Relay

Overload Release	
P16 =	0.1 – 0.16A
P24 =	0.16 – 0.24A
P40 =	0.24 – 0.4A
P60 =	0.4 – 0.6A
001 =	0.6 – 1A
1P6 =	1 – 1.6A
2P4 =	1.6 – 2.4A
004 =	2.4 – 4A
006 =	4 – 6A
009 =	6 – 9A
012 =	9 – 12A

Frame Size	
A =	45 mm Mini

Trip Class	
C1 =	Class 10A

Product Selection

Non-reversing Mini Contactors



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Table 34-24. Full Voltage Non-reversing Contactors

Opera-tional Current AC-3 Amp Rating 380/400V	Conven-tional Free Air Thermal Current AC-1 at 50°C	Maximum kW Ratings AC-3				Maximum Three-phase Motor Rating							No. of Power Poles	Aux. Con-tacts	Catalog Number ①		Price U.S. $	
		3-Phase Motors 50 – 60 Hz				1-Phase Horsepower Ratings			3-Phase Horsepower Ratings						Screw Terminals	Spring Cage Terminals		
		220 – 240V	380 – 400V	550V	660/ 690V	115V	200V	230V	200V	230V	460V	575V					AC Coil	DC Coil
6.6	20	1.5	3	3	3	1/4	3/4	1	1-1/2	2	3	3	3	1NO	**XTMC6A10_**	**XTMCC6A10_**		
6.6	20	1.5	3	3	3	1/4	3/4	1	1-1/2	2	3	3	3	1NC	**XTMC6A01_**	**XTMCC6A01_**		
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	3	1NO	**XTMC9A10_**	**XTMCC9A10_**		
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	3	1NC	**XTMC9A01_**	**XTMCC9A01_**		
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	4	—	**XTMF9A00_**	**—**		

① Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-26**.

Reversing Mini Contactors

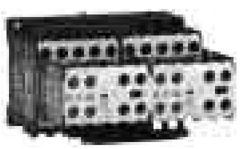


Table 34-25. Full Voltage Reversing Contactors

Opera-tional Current AC-3 Amp Rating 380/400V	Conven-tional Free Air Thermal Current AC-1 at 50°C	Maximum kW Ratings AC-3				Maximum 3-Phase Current Motor Rating							Spare Auxiliary Contacts		Catalog Number ②③	Price U.S. $	
		3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings			3-Phase hp Ratings				K1M	K2M			
		220/ 230/ 240V	380/ 400/ 440V	500V	660/ 690V	115V	200V	230V	200V	230V	460V	575V				AC	DC
6.6	20	1.5	3	3	3	1/4	3/4	1	1-1/2	2	3	3	63 64	63 64	**XTMR6A21_**		
8.8	20	2.2	4	4	4	1/2	1	1-1/2	2	3	5	5	63 64	63 64	**XTMR9A21_**		

② Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-26**.
③ The factory installed reversing mini contactor includes (2) XTMC…01 Contactors, (2) XTMCXFA20 2NO Front Mount Auxiliary Contacts (1) XTMCXRL Reversing Link Kit and (1) XTMCXML Mechanical Interlock.

Overload Relays .... **Page 34-20**
Accessories .... **Page 34-21**
Dimensions .... **Page 34-29**
Discount Symbol **1CD7**

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Table 34-26. Magnet Coil Suffix

Coil Voltage	Suffix Code	Coil Voltage	Suffix Code	Coil Voltage	Suffix Code	Coil Voltage	Suffix Code ①
110V 50 Hz, 120V 60 Hz	**A**	415V 50 Hz, 480V 60 Hz	**C**	400V 50 Hz	**N**	120V DC	**AD**
220V 50 Hz, 240V 60 Hz	**B**	550V 50 Hz, 600V 60 Hz	**D**	380V 60 Hz	**P**	220V DC	**BD**
230V 50 Hz	**F**	208V 60 Hz	**E**	12V 50/60 Hz	**R**	12V DC	**RD**
24V 50/60 Hz	**T**	190V 50 Hz, 220V 60 Hz	**G**	24V 50 Hz	**U**	48V DC	**WD**
24V DC	**TD** ①	240V 50 Hz, 277V 60 Hz	**H**	42V 50 Hz, 48V 60 Hz	**W**	—	—
—	—	380V 50 Hz, 440V 60 Hz	**L**	48V 50 Hz	**Y**	—	—

① With DC Operation: Integrated diode resistor combination, coil rating 2.6W.

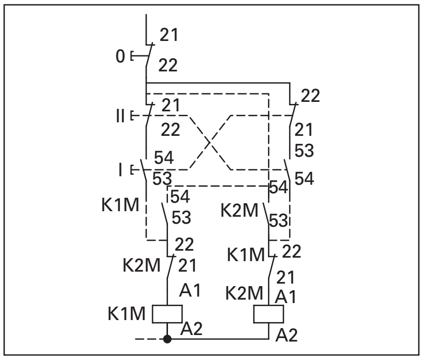


Figure 34-19. XTMR Reversing Contactor Control Wiring Diagram

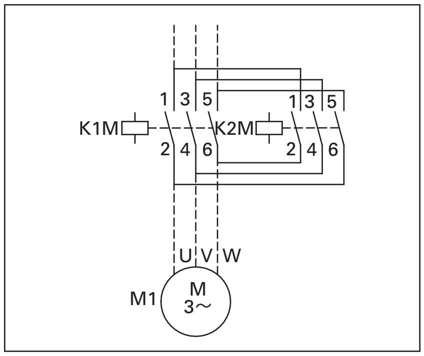


Figure 34-20. XTMR Reversing Contactor Power Wiring Diagram

Notes:

IEC Utilization Categories, see **Page 34-210**, Reference Data.

AC-1: Non-inductive or slightly inductive loads.

AC-3: Squirrel-cage motors — starting, switching of motors during running.

AC-4: Squirrel-cage motors — starting, plugging, inching.

Star-Delta (Wye-Delta) Miniature Contactors

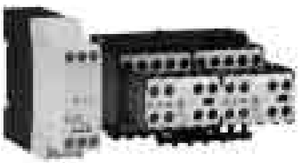


Table 34-27. Star-Delta (Wye-Delta) Miniature Contactor Configuration ①

Maximum kW Ratings AC-3 3-Phase Motors 50 – 60 Hz			Maximum 3-Phase Current Motor Rating 1-Phase hp Ratings			3-Phase hp Ratings				Max. Changeover Time (sec.)	Spare Auxiliary Contacts	Components Description	Catalog Number ②
220/230/240V	380/400/440V	500V	115V	200V	230V	200V	230V	460V	575V		K1M		
4	5.5	5.5	1/2	1	1-1/2	2	3	5	7-1/2	30	21 31 53 / 22 32 54	K1M Main Contactor	**XTMC9A10_**
												K1M Auxiliary Contact	**XTMCXFC22**
												K5M Delta Contactor	**XTMC9A01_**
												K3M Star Contactor	**XTMC9A10_**
												K3M Auxiliary Contact	**XTMCXFC02**
												K1T Timing Relay	**XTTR6A60S51B**

① Operating Frequency: 30 Starts/hour
② Underscore (_) indicates magnet coil suffix required. See **Table 34-29**.

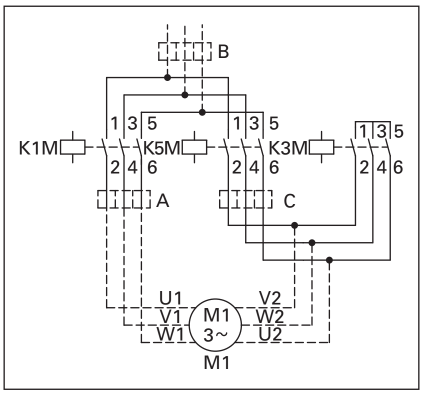


Figure 34-21. Star-Delta (Wye-Delta) Power Wiring Diagram

Table 34-28. Mini Overload Relay Settings (A)

Setting	Starting
A: I_N x 0.58	≤ 15 sec
Motor Protection in the Y and Delta Configurations.	
B: I_N x 1	15 – 40 sec
Only partial motor protection in star position	
C: I_N x 0.58	> 40 sec
Motor not protected in star position.	
Timing Relay set to approximately 10 sec.	

Note: Depending on the coordination type required (i.e. Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Table 34-29. Magnet Coil Suffix

Coil Voltage	Suffix Code	Coil Voltage	Suffix Code	Coil Voltage	Suffix Code	Coil Voltage	Suffix Code ③
110V 50 Hz, 120V 60 Hz	**A**	415V 50 Hz, 480V 60 Hz	**C**	400V 50 Hz	**N**	120V DC	**AD**
220V 50 Hz, 240V 60 Hz	**B**	550V 50 Hz, 600V 60 Hz	**D**	380V 60 Hz	**P**	220V DC	**BD**
230V 50 Hz	**F**	208V 60 Hz	**E**	12V 50/60 Hz	**R**	12V DC	**RD**
24V 50/60 Hz	**T**	190V 50 Hz, 220V 60 Hz	**G**	24V 50 Hz	**U**	48V DC	**WD**
24V DC	**TD** ③	240V 50 Hz, 277V 60 Hz	**H**	42V 50 Hz, 48V 60 Hz	**W**	—	—
—	—	380V 50 Hz, 440V 60 Hz	**L**	48V 50 Hz	**Y**	—	—

③ With DC Operation: Integrated diode resistor combination, coil rating 2.6W.

Overload Relays .... **Page 34-20**
Accessories .... **Page 34-21**
Dimensions .... **Page 34-29**
Discount Symbol **1CD7**

Overload Relays



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Table 34-30. Mini Overload Relays ①②

Overload Release I_t	Trip Class	Contact Sequence	Contact Configuration	Short Circuit Protection (A)				Catalog Number	Price U.S. $
				Type 1 Coordination, gG/gL	Type 2 Coordination, gG/gL	Circuit Breaker	CEC/NEC Fuse		
0.1 – 0.16A 0.16 – 0.24A 0.24 – 0.4A 0.4 – 0.6A	10A	97 95 / 2 4 6 98 96	1NO-1NC	20 20 20 20	0.5 1 2 2	15 15 15 15	— — — —	**XTOMP16AC1** **XTOMP24AC1** **XTOMP40AC1** **XTOMP60AC1**	
0.6 – 1A 1 – 1.6A 1.6 – 2.4A	10A		1NO-1NC	20 20 20	4 6 6	15 15 15	3 6 6	**XTOM001AC1** **XTOM1P6AC1** **XTOM2P4AC1**	
2.4 – 4A 4 – 6A 6 – 9A 9 – 12A	10A		1NO-1NC	20 20 20 —	10 10 10 —	15 15 15 —	15 20 35 45	**XTOM004AC1** **XTOM006AC1** **XTOM009AC1** **XTOM012AC1**	

① Short-circuit protection:
Observe the maximum permissible fuse of the contactor with direct device mounting. See **MN03402002E** for more information.
② When fitted directly to the contactor, a clearance of at least 5 mm is required between the overload relays.

Tripping Characteristics Chart

These tripping characteristics are mean values of the spread at 20°C ambient temperature in a cold state. Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approx. 25% of the read off value. Specific characteristics for each individual setting range can be found on **Page 34-28**.

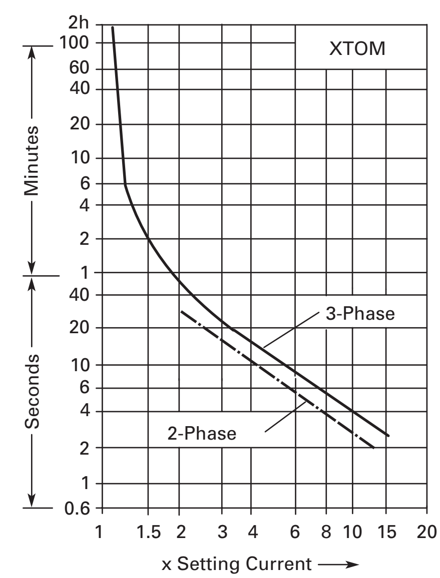


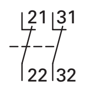
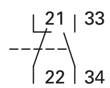
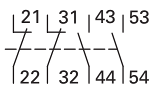
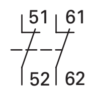
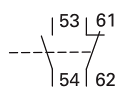
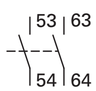
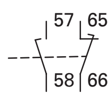
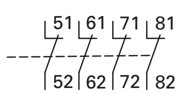
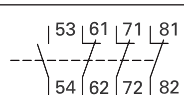
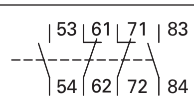
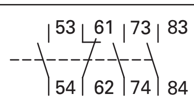
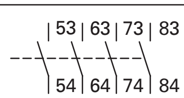
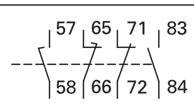
Figure 34-22. Tripping Characteristics

Accessories

Auxiliary Contacts

Front mounted snap-on auxiliary contacts for mini contactors are available with screw or spring cage terminals in a variety of contact configurations. Auxiliary contact modules are standard with interlocked opposing contacts, except in the case of early-make or late-break contacts.

Table 34-31. Front Mount Auxiliary Contacts for Use with Mini Contactors

Conventional Free Air Thermal Current, $I_{th} = I_e$, AC-1 in Amps	Contact Configuration	Contact Sequence	Package Qty.	Catalog Number		Price U.S. $ ①
				Screw Terminals	Spring Cage Terminals	
10	2NC		5	**XTMCXFC02**	—	
10	1NO-1NC		5	**XTMCXFD11**	**XTMCXFDC11**	
10	2NO-2NC		5	**XTMCXFC22**	**XTMCXFCC22**	
10	2NC		5	**XTMCXFA02**	—	
10	1NO-1NC		5	**XTMCXFA11**	**XTMCXFAC11**	
10	2NO		5	**XTMCXFA20**	—	
10	$1NO_E$-$1NC_L$		5	**XTMCXFAL11** ②	—	
10	4NC		5	**XTMCXFA04**	**XTMCXFAC04**	
10	1NO-3NC		5	**XTMCXFA13**	**XTMCXFAC13**	
10	2NO-2NC		5	**XTMCXFA22**	**XTMCXFAC22**	
10	3NO-1NC		5	**XTMCXFA31**	**XTMCXFAC31**	
10	4NO		5	**XTMCXFA40**	**XTMCXFAC40**	
10	1NO-1NC 1N O_E-$1NC_L$		5	**XTMCXFAL22** ②	**XTMCXFCLC22** ②	

① Orders must be placed in multiples of package quantity listed.
② 1 early-make contact (NO_E), 1 late-break contact (NC_L).

Discount Symbol **1CD7**

RC Suppressor



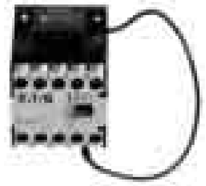


Table 34-32. RC Suppressor ①

Voltage	For Use with…	Circuit Symbol	Package Qty.	Catalog Number	Price U.S. $ ②
24 – 48	XTMC6A…, XTMC9A…	A1 A2	10	**XTMCXRSW**	
48 – 130	XTMC6A…, XTMC9A…		10	**XTMCXRSA**	
110 – 250	XTMC6A…, XTMC9A…		10	**XTMCXRSB**	
24 – 48	XTMCC6A…, XTMCC9A…		10	**XTMCXRSCW**	
48 – 130	XTMCC6A…, XTMCC9A…		10	**XTMCXRSCA**	
110 – 250	XTMCC6A…, XTMCC9A…		10	**XTMCXRSCB**	

① For AC operated contactors, 50/60 Hz. Note drop-out delay.
② Orders must be placed in multiples of package quantity listed.

Varistor Suppressor





Table 34-33. Varistor Suppressor ③

Voltage	For Use with…	Circuit Symbol	Package Qty.	Catalog Number	Price U.S. $ ④
24 – 48	XTMC6A…, XTMC9A…	A1 A2	10	**XTMCXVSW**	
48 – 130	XTMC6A…, XTMC9A…		10	**XTMCXVSA**	
110 – 250	XTMC6A…, XTMC9A…		10	**XTMCXVSB**	
380 – 415	XTMC6A…, XTMC9A…		10	**XTMCXVSN**	
24 – 48	XTMCC6A…, XTMCC9A…		10	**XTMCXVSCW**	
48 – 130	XTMCC6A…, XTMCC9A…		10	**XTMCXVSCA**	
110 – 250	XTMCC6A…, XTMCC9A…		10	**XTMCXVSCB**	

③ For AC operated contactors, 50/60 Hz. DC operated contactors have integrated varistor suppressors.
④ Orders must be placed in multiples of package quantity listed.

Mechanical Interlock

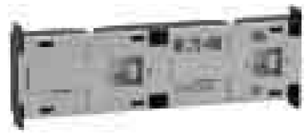


Table 34-34. Mechanical Interlock

Description	Package Qty.	Catalog Number	Price U.S. $ ⑤
Mechanical Interlock	5	**XTMCXML**	

⑤ Orders must be placed in multiples of package quantity listed.

Note:
- For two contactors with AC or DC operated magnet system that are horizontally or vertically mounted, the distance between contactors is 0 mm, and the mechanical lifespan is 2.5 x 10^6 operations.

Reversing Link Kit



Table 34-35. Reversing Link Kit

Description	Package Qty.	Catalog Number	Price U.S. $
Main current wiring for reversing contactors and starters.	1	**XTMCXRL**	

Notes:
- The following control cables are integrated as part of the electrical interlock:
  K1M: A1 — K2M: 21; K1M: 21 — K2M: A1
- Reversing Link Kit does not include mechanical interlock. See **Table 34-34** for Mechanical Interlock.

Star-Delta (Wye-Delta) Link Kit



Table 34-36. Star-Delta (Wye-Delta) Link Kit

Description	Package Qty.	Catalog Number	Price U.S. $
Main current wiring for star-delta (wye-delta) combinations. Includes the Star-Delta Bridge.	1	**XTMCXSDL**	

Notes:
- The following control cables are integrated in addition to the electrical interlock:
  K3M: A1 — K5M: 21; K3M: 21 — K5M: A1; K3M: A2 — K5M: A2
- When combined with overload relay use separate mounting.

Discount Symbol **1CD7**

Star-Delta (Wye-Delta) Bridge



Table 34-37. Star-Delta (Wye-Delta) Bridge

Contact Sequence	Package Qty.	Catalog Number	Price U.S. $ ①
	20	**XTMCXSDB** ②	

① Orders must be placed in multiples of package quantity listed.
② Protected against direct contact in accordance with IEC 536.

Paralleling Link Set for Main Contacts

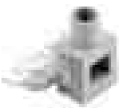
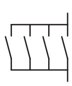


Table 34-38. Paralleling Link Set for Main Contacts

Contact Sequence	Package Qty.	Catalog Number	Price U.S. $ ③
	5	**XTMCXPLK** ④⑤⑥	

③ Orders must be placed in multiples of package quantity listed.
④ Protected against direct contact in accordance with IEC 536.
⑤ 4th pole can be broken off:
4-pole: I_{th} = 60A; 3-pole: I_{th} = 50A
⑥ AC-1 current carrying capacity of the open contactor increases by a factor of 2.5.

Connector



Table 34-39. Connector

Description	Package Qty.	Catalog Number	Price U.S. $ ⑦
For mechanically arranging contactors and timing relays in combinations.	50	**XTMCXCN** ⑧	

⑦ Orders must be placed in multiples of package quantity listed.
⑧ 0 mm distance between contactors.

IP40 Sealable Transparent Shroud



Table 34-40. IP40 Sealable Transparent Shroud

Description	Package Qty.	Catalog Number	Price U.S. $
IP40 Sealable Transparent Shroud, snap fitting on mini contactor.	1	**XTMCXSHROUD**	

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Discount Symbol **1CD7**

Technical Data and Specifications

Table 34-41. *XT* Miniature Controls — General Specifications

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	AC Coils	DC Coils	AC Coils	DC Coils	AC Coils	DC Coils
Physical and Electrical (Continued)						
Standards	IEC/EN 60947, VDE 0660, CSA, UL, CCC					
Weights in kg [lb]	0.2 [0.44]	0.17 [0.37]	0.2 [0.44]	0.17 [0.34]	0.2 [0.44]	0.17 [0.37]
Mechanical Life — Operations	10,000,000	20,000,000	10,000,000	20,000,000	20,000,000	—
Mechanical Life — Coil @ 50 Hz	7	—	7	—	7	—
Maximum mechanical operating frequency (ops/hr)	9000					
Insulation Voltage (U_i) VAC	690	690	690	690	690	690
Impulse Withstand Voltage (U_{imp}) VAC	6000	6000	6000	6000	6000	6000
Operational Voltage (U_e) VAC	690	690	690	690	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 between coil and contacts (VAC) between contacts (VAC)	 300 300	 300 300	 300 300	 300 300	 300 300	 300 300
Making Capacity (amps)	110	110	110	110	110	110
Breaking Capacity (amps) 220/230V 380/400V 500V 660/690V	 90 90 64 54	 90 90 64 54	 90 90 64 54	 90 90 64 54	 90 90 64 54	 90 90 64 54
Short-Circuit Protection rating maximum fuse (gL/gG) Type 2 Coordination (A) Type 1 Coordination (A)	 10 20	 10 20	 10 20	 10 20	 10 20	 10 20
Degree of Protection	IP20					
Protection against direct contact when actuated from front (IEC 536)	Finger- and back-of-hand proof					
Terminal Capacity of main and auxiliary contacts Solid (mm²)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible with ferrule (mm²)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)	1 x (0.75 – 1.5) 2 x (0.75 – 1.5)
Solid or Stranded (AWG)	18-14	18-14	18-14	18-14	18-14	18-14
Terminal Screw	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
Pozidriv screwdriver	Size 2	Size 2	Size 2	Size 2	Size 2	Size 2
Standard screwdriver (mm)	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6	0.8 x 5.5 1 x 6
Max. Tightening Torque Nm Lb-in	 1.2 10.6	 1.2 10.6	 1.2 10.6	 1.2 10.6	 1.2 10.6	 1.2 10.6
Terminal Capacity of spring cage main terminals Solid (mm²)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)	 1 x (1 – 2.5) 2 x (1 – 2.5)
Flexible with ferrule (mm²)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)	1 x (1 – 2.5) 2 x (1 – 2.5)
Standard screwdriver (mm)	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5	0.6 x 3.5
Mounting Position	As required, except vertical with terminals A1/A2 at the bottom 					
Environmental						
Ambient Temperature	-25° to 50°C [-13° to 122°F]					
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 ms Contactor without auxiliary contact module Main contact — make contact Main contact — break/make contact Contactor with auxiliary contact module Main contact — make contact Main contact — make/break contact	 10g 10/8g 10g 20/20g	 10g 10/8g 10g 20/20g	 10g 10/8g 10g 20/20g	 10g 10/8g 10g 20/20g	 10g — 10g 20/20g	 10g — 10g 20/20g
Climatic Proofing	Damp heat, constant, to IEC 60 068-2-78; Damp heat, cyclic, to IEC 60 068-2-30					
Pollution Degree	III/3	III/3	III/3	III/3	III/3	III/3

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Table 34-42. *XT* Miniature Controls — Magnet Systems

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	AC Coils	DC Coils	AC Coils	DC Coils	AC Coils	DC Coils
Voltage Tolerance						
Pick-Up (x U_C)						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	0.8 – 1.1	—	0.8 – 1.1	—	0.8 – 1.1	—
Dual frequency coil 50/60 Hz	0.85 – 1.1	—	0.85 – 1.1	—	0.85 – 1.1	—
DC operated ①	—	0.8 – 1.1	—	0.8 – 1.1	—	0.85 – 1.1
Power Consumption						
AC Operation						
Pick-Up VA						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	25	—	25	—	25	—
Dual frequency coil 50/60 Hz at 50 Hz	30	—	30	—	30	—
Dual frequency coil 50/60 Hz at 60 Hz	29	—	29	—	29	—
Pick-Up W						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	22	—	22	—	22	—
Dual frequency coil 50/60 Hz at 50 Hz	26	—	26	—	26	—
Dual frequency coil 50/60 Hz at 60 Hz	24	—	24	—	24	—
Sealing VA						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	4.6	—	4.6	—	4.6	—
Dual frequency coil 50/60 Hz at 50 Hz	5.4	—	5.4	—	5.4	—
Dual frequency coil 50/60 Hz at 60 Hz	3.9	—	3.9	—	3.9	—
Sealing W						
Single-voltage coil 50 Hz and dual-voltage coil 50 Hz, 60 Hz	1.3	—	1.3	—	1.3	—
Dual frequency coil 50/60 Hz at 50 Hz	1.6	—	1.6	—	1.6	—
Dual frequency coil 50/60 Hz at 60 Hz	1.1	—	1.1	—	1.1	—
DC operated ①						
Power consumption pick-up = sealing (VA/W)	—	2.6	—	2.6	—	2.6
Duty Factor (%)	100	100	100	100	100	100
Switching Time at 100% U_C						
Make Contact						
Closing delay min (mS)	14	26	14	26	14	26
Closing delay max (mS)	21	35	21	35	21	35
Opening delay min (mS)	8	15	8	15	8	15
Opening delay max (mS)	18	25	18	25	18	25
Closing delay with top mounting auxiliary contact (mS)	max. 45	max. 70	max. 45	max. 70	max. 45	max. 70
Reversing contactors						
Changeover time at 100% U_C						
Min (mS)	16	40	16	40	16	40
Max (mS)	21	50	21	50	21	50
Arcing time at 690V AC (mS)	max. 12	max. 12	max. 12	max. 12	max. 12	max. 12

① Smoothed DC or three-phase bridge rectifier.

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Table 34-43. XT Miniature Controls

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	AC Coils	DC Coils	AC Coils	DC Coils	AC Coils	DC Coils
AC-1 Operation						
Conventional free air thermal current, 3-pole, 50 – 60 Hz (A)						
at 40°C (I_{th})	22	22	22	22	22	22
at 50°C (I_{th})	20	20	20	20	20	20
at 55°C (I_{th})	19	19	19	19	19	19
Conventional free air thermal current, 1-pole (I_{th})	50	50	50	50	60	60
AC-3 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes (A)						
220/230V	6.6	6.6	9.0	9.0	9.0	9.0
240V	6.6	6.6	9.0	9.0	9.0	9.0
380/400V	6.6	6.6	9.0	9.0	9.0	9.0
415V	6.6	6.6	9.0	9.0	9.0	9.0
440V	6.6	6.6	9.0	9.0	9.0	9.0
500V	5	5	6.4	6.4	6.4	6.4
660/690V	3.5	3.5	4.8	4.8	4.8	4.8
Rated power (P) in kilowatts (kW)						
220/230V	1.5	1.5	2.2	2.2	2.2	2.2
240V	1.8	1.8	2.5	2.5	2.5	2.5
380/400V	3	3	4	4	4	4
415V	3.1	3.1	4.3	4.3	4.3	4.3
440V	3.3	3.3	4.6	4.6	4.6	4.6
500V	3	3	4	4	4	4
660/690V	3	3	4	4	4	4
AC-4 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes (A)						
220/230V	5	5	6.6	6.6	6.6	6.6
240V	5	5	6.6	6.6	6.6	6.6
380/400V	5	5	6.6	6.6	6.6	6.6
415V	5	5	6.6	6.6	6.6	6.6
440V	5	5	6.6	6.6	6.6	6.6
500V	3.7	3.7	5	5	5	5
660/690V	2.9	2.9	3.4	3.4	3.4	3.4
Rated power (P) in kilowatts (kW)						
220/230V	1.1	1.1	1.5	1.5	1.5	1.5
240V	1.3	1.3	1.8	1.8	1.8	1.8
380/400V	2.2	2.2	3	3	3	3
415V	2.3	2.3	3.1	3.1	3.1	3.1
440V	2.4	2.4	3.3	3.3	3.3	3.3
500V	2.2	2.2	3	3	3	3
660/690V	2.2	2.2	3	3	3	3

① At maximum permissible ambient temperature.

Table 34-44. *XT* Miniature Controls

Description	XTMC6A…		XTMC9A…		XTMF9A…	
	AC Coils	DC Coils	AC Coils	DC Coils	AC Coils	DC Coils
DC-1 Operation ②						
12V	20	20	20	20	—	—
24V	20	20	20	20	—	—
60V	20	20	20	20	—	—
110V	20	20	20	20	—	—
220V	20	20	20	20	—	—
DC-3 Operation ②						
12V	6	6	8	8	—	—
24V	6	6	8	8	—	—
60V	3	3	4	4	—	—
110V	2	2	3	3	—	—
220V	—	—	—	—	1	1
DC-4 Operation ②						
12V	1.8	1.8	2.5	2.5	—	—
24V	1.8	1.8	2.5	2.5	—	—
60V	1.8	1.8	2.5	2.5	—	—
110V	1.1	1.1	1.5	1.5	2.5	2.5
220V	0.2	0.2	0.3	0.3	1	1
Current Heat Loss (3- or 4-pole) in watts						
at I_{th}	2	3.5	2	3.5	2.7	4.7
at I_e to AC-3/400V	0.3	0.4	0.5	0.7	—	—

② Rated operation current (I_e) in amperes, at maximum permissible ambient temperature.

Table 34-45. *XT* Miniature Controls — Auxiliary Contacts

Description	Built-in Auxiliary XTMC	Add-on Auxiliary XTMCXF…
Interlocked opposing contacts to ZH1/457, including auxiliary contact module	Yes	Yes
Rated impulse withstand voltage, U_{imp} (VAC)	6000	6000
Overvoltage category / pollution degree	III/3	III/3
Rated insulation voltage, U_i (VAC)	690	690
Rated operational voltage, U_e (VAC)	600	600
Safe isolation to VDE 0106 Part 101 and Part 101(A) in VAC between coil and auxiliary contacts between the auxiliary contacts	 300 300	 300 300
Rated Operational Current AC-15, I_e 220/240V 380/415V 500V DC-13 (Contacts in Series) 1: 24V 2: 60V 3: 100V 3: 220V	 6A 3A 1.5A 2.5A 2.5A 1.5A 0.5A	 4A 2A 1.5A 2.5A 2.5A 1.5A 0.5A
Conventional thermal current, I_{th}	10A	10A
Control circuit reliability (at U_e = 24 VDC, U_{min} = 17 V, I_{min} = 5.4 mA)	<10-8, < one failure at 100 million operations	
Component Lifespan at U_e = 240V AC-15, operations x 10^6 DC-13 L/R = 50 mS: 2 contacts in series at I_e = 0.5A, operations x 10^6	 0.2 0.15	 0.2 0.15
Short Circuit rating without welding Short Circuit protection rating maximum fuse, 500V gG/gL Short Circuit protection rating maximum fuse, 500V fast	 6A 10A	 6A 10A
Current heat loss at conventional free air thermal current I_{th} per contact, W	0.2	0.2

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Electrical Switching Operation Charts

Squirrel-cage motors
Operating characteristics
Starting: from rest
Stopping: after attaining a full running speed
Electrical Characteristics —
Make (NO): Up to 6x rated motor current
Breaking (NC): 1x rated motor current

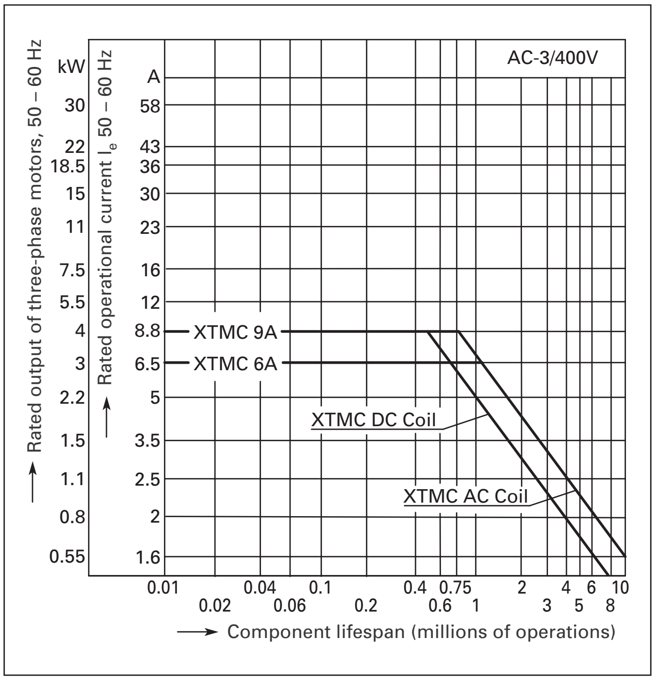


Figure 34-23. Normal Switching Duty — AC-3/400V

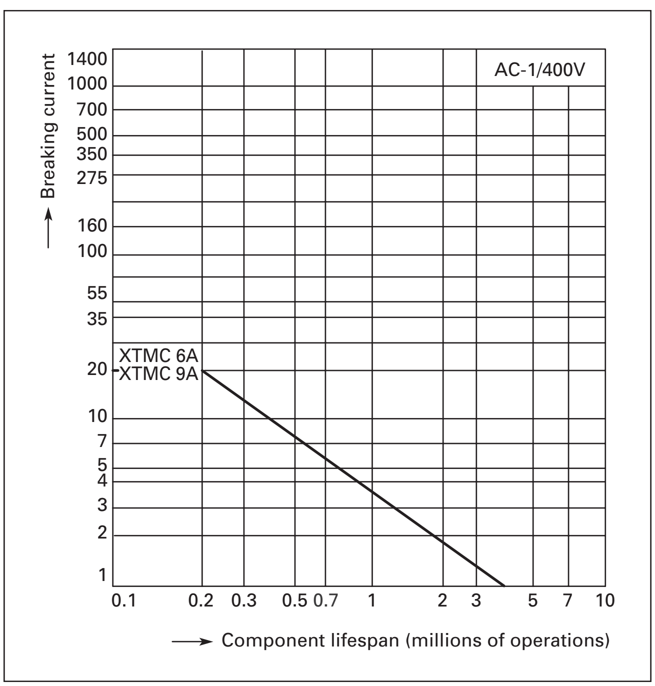


Figure 34-24. Switching Duty for Non-motor Loads, 3- & 4-Pole — AC-1/400V

Squirrel-cage motors
Operating characteristics
Jogging, plugging, reversing
Electrical Characteristics —
Make (NO): 6x rated motor current
Breaking (NC): 6x rated motor current

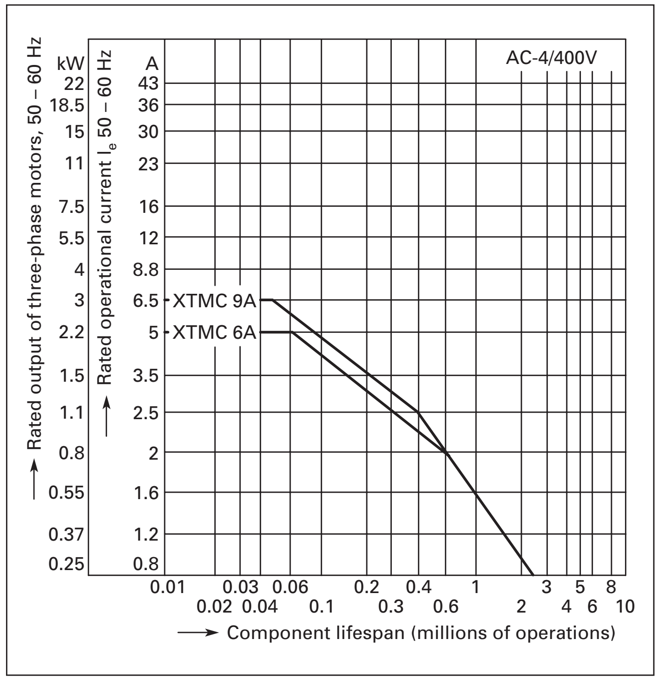


Figure 34-25. Extreme Switching Duty — AC-4/400V

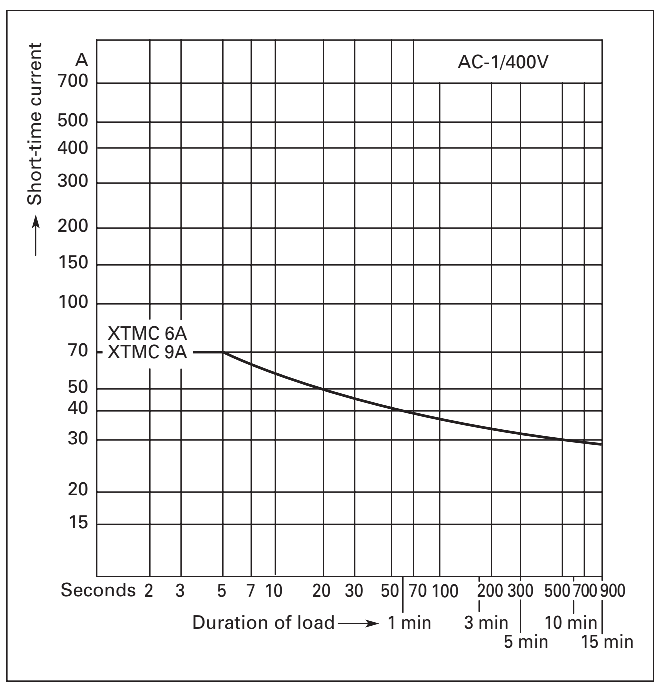
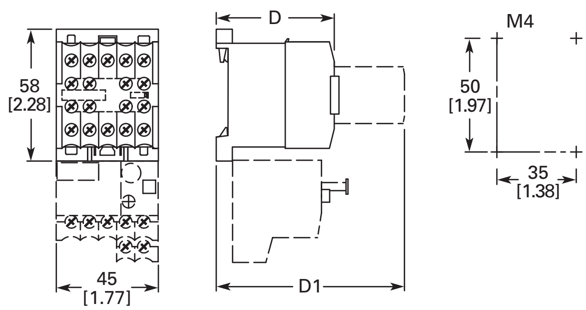


Figure 34-26. Short Time Loading, 3-Pole — AC-1/400V (time interval between two loading cycles: 15 minutes)

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Dimensions



	XTMC	XTMCC
D	52 [2.05]	54 [2.13]
D1	83 [3.27]	86 [3.39]

Figure 34-27. Non-reversing Mini Contactor

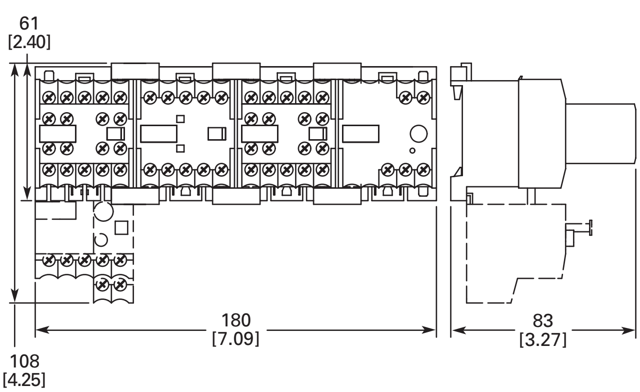


Figure 34-28. Star-Delta Starter Combinations

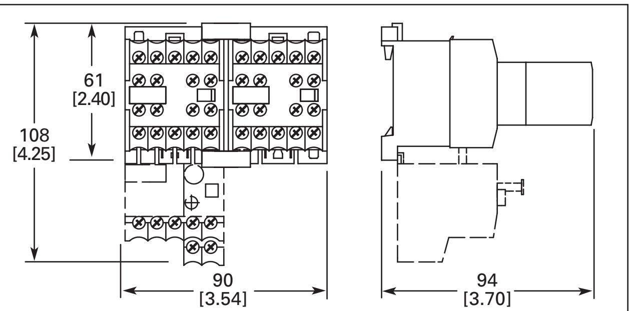


Figure 34-29. Reversing Mini Contactor

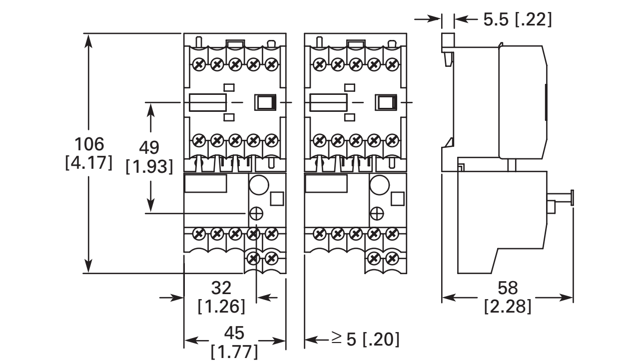


Figure 34-30. Non-reversing Mini Contactor with Overload Relay

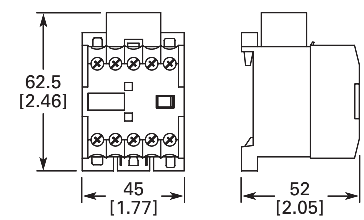


Figure 34-31. XTMCXRSA, XTMCXVSA Mini Suppressors — Approximate Dimensions in mm [in]

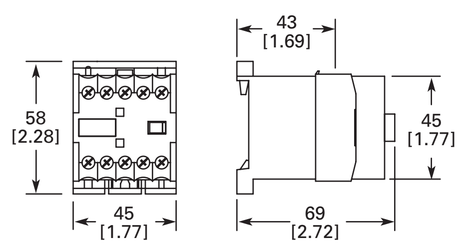


Figure 34-32. XTMCXTSA Mini Sealable Shroud — Approximate Dimensions in mm [in]

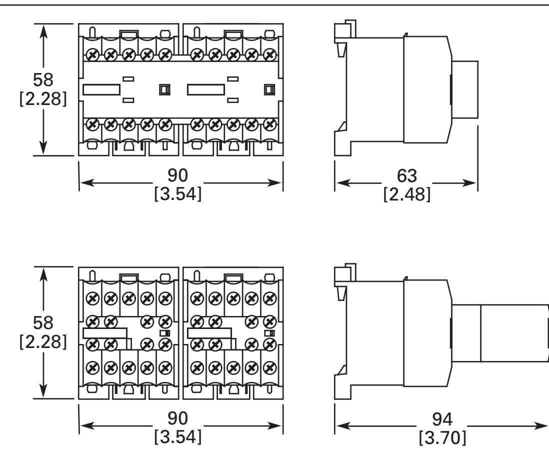


Figure 34-33. XTMCXML Mechanical Interlock — Approximate Dimensions in mm [in]

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Contents



***XT* Family of Contactors**

Contactors and Starters

Product Description

Eaton's new line of ***XT*** Contactors and Starters includes non-reversing and reversing contactors, overload relays and a variety of related accessories. Because ***XT*** meets IEC, UL, CSA, CCC and CE standards, it is the perfect product solution for IEC applications all over the world. The compact, space saving, and easy to install ***XT*** line of IEC contactors and starters is the efficient and effective solution for customer applications from 7A to 2000A.

Features and Benefits

- AC control from 12V to 600V 50/60 Hz
- DC control from 12V to 220V
- Available with screw or spring cage terminals
- Reversing or non-reversing contactors and starters
- AC-3 contactor ratings to 1000A and AC-1 contactor ratings to 2000A
- Non-reversing starters to 650A
- Panel or DIN rail mounting to 65A
- IP20 finger and back-of-hand proof
- Large ambient temperature range, -25 to 50°C [-13 to 122°F]
- AC and DC controlled contactors in the same compact frame
- Low power consumption DC coils
- Built-in NO or NC auxiliary contacts to 32A
- Plug-in accessories for reduced installation time
- Coil replacement on Frames C – N (18 – 820A)
- Contact replacement on Frames D – N (40 – 820A)
- Integrated suppressor 7 – 150A DC operated contactors and 185 – 2000A AC and DC operated contactors

Standards and Certifications

- IEC EN 60947
- CE Approved
- UL
- CSA
- CCC
- ATEX
- RoHS

Note: For Type 2 Coordination, see **Page 34-200**.

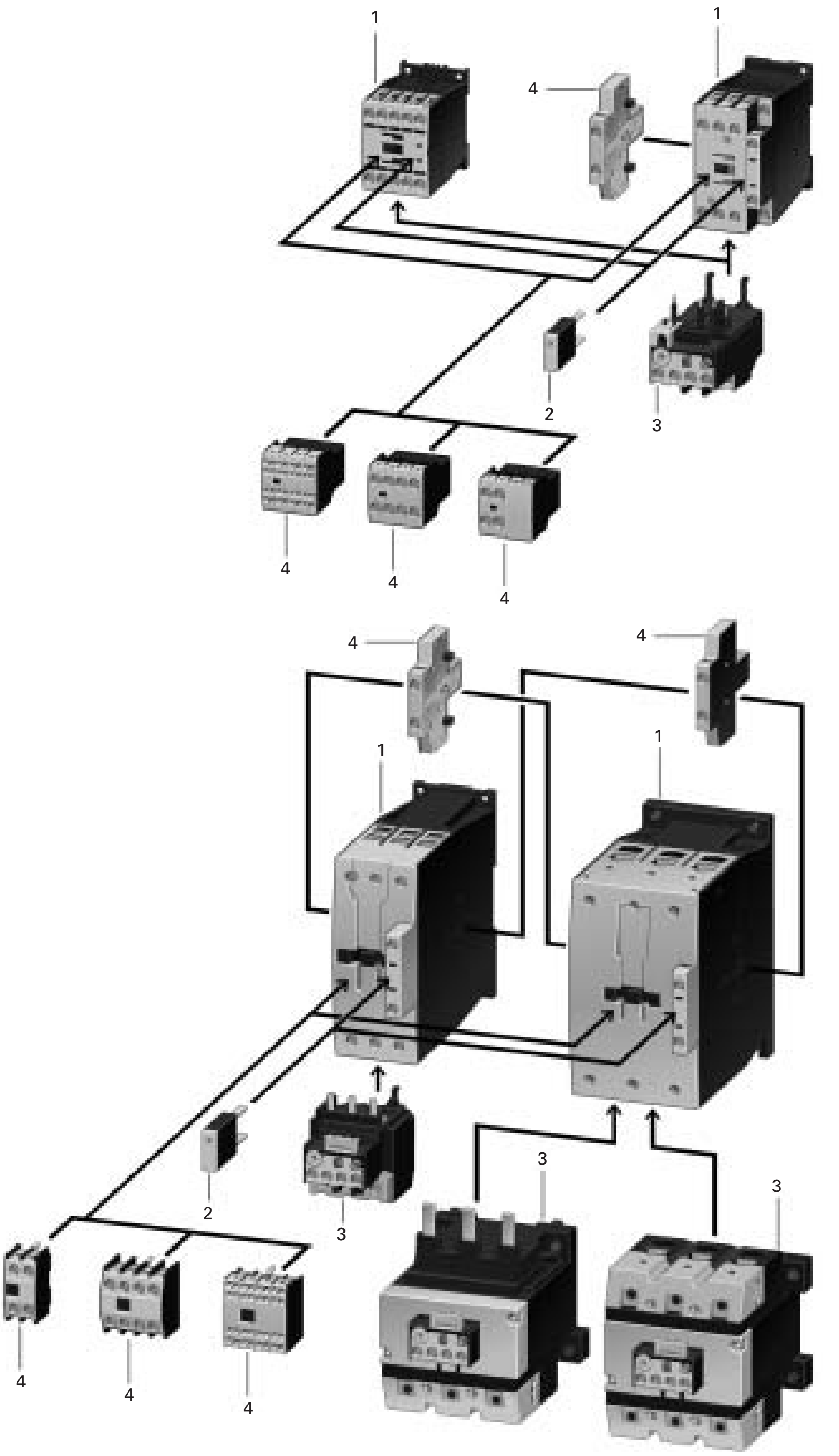


Table 34-46. Product Identification

No.	Description	Page
Contactor Up to 150A AC-3		
1	AC: ■ 12 – 600V, 50, 60, 50/60 Hz ■ 0.8 – 1.1 x U_C	**34-34**
	DC: ■ 12 – 250V ■ XTCE…B_ (7 – 15A): 0.8 – 1.1 x U_C ■ XTCE…C_ – XTCE…G_ (18 – 150A): 0.7 – 1.2 x U_C ■ 24V: 0.7 – 1.3 x U_C at 40°C without additional auxiliary contacts	
	Coils for Special Voltages	
	“Safe Isolation” to IEC 536 between coil and contacts	
Suppressors		
2	■ RC suppressor ■ Varistor suppressor ■ Free-wheel diode suppressor	**34-54**
Overload Relays		
3	■ Can be mounted directly ■ Separate mounting, possible ■ Protection of EEx e motors	**34-95**
Auxiliary Contact Modules		
4	■ 2-pole, plug-in type ■ 4-pole, plug-in type ■ Overlapping contacts ■ 2-pole, side mounting	**34-49**

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Contactors and Starters

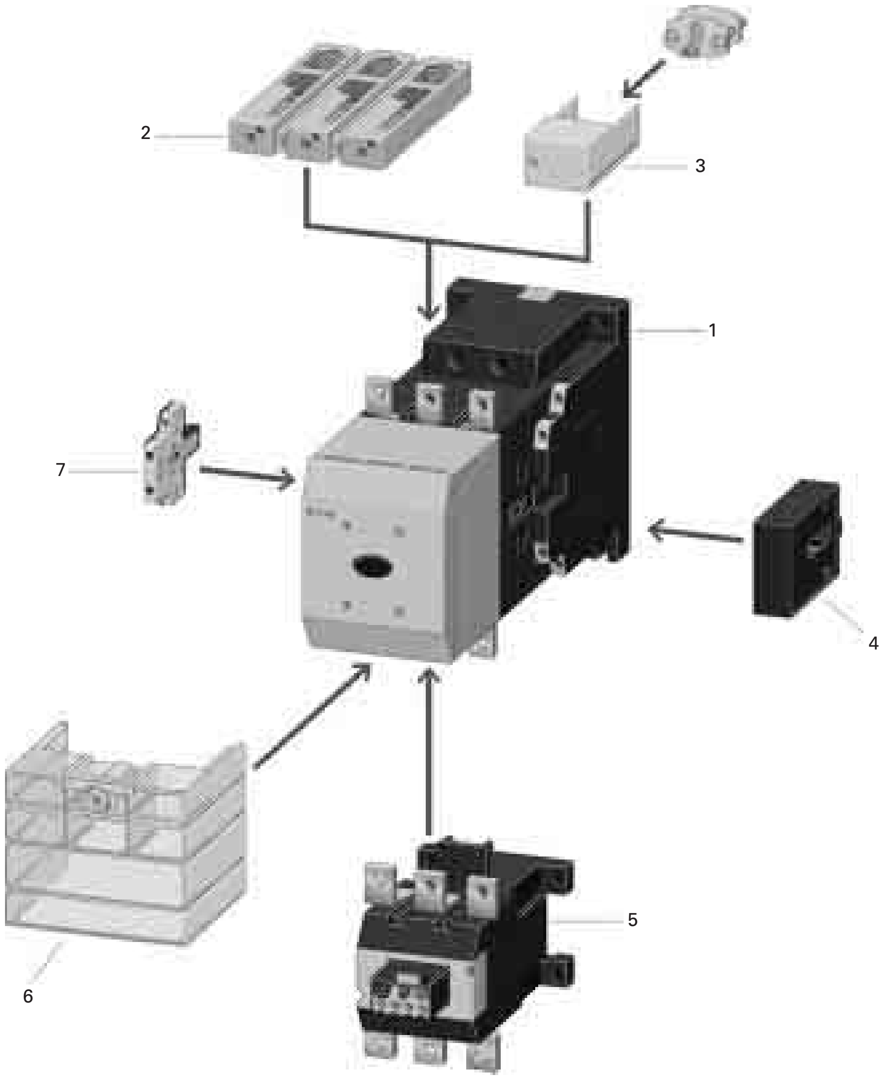


Table 34-47. XTCE185 – XTCEC20 Contactors

No.	Description	Page
XTCE Contactors for 185 – 2000A (AC-3)		
1	Multi-Voltage Coils: ■ 24 – 48V DC ■ 48 – 110V AC/DC ■ 110 – 250V AC/DC ■ 250 – 500V AC ■ 0.7 – 1.15 x U_c	**34-34**
	Actuation Options: ■ Directly ■ From the PLC ■ With low-consumption contact Minimized pick-up and seal-ing power.	
XTCS Contactors for 185 – 500A (AC-3)		
1	Control Voltages: ■ 110 – 120V 50/60 Hz ■ 220 – 240V 50/60 Hz Conventional operation.	**34-35**
Cable Terminal Block		
2	■ 1 or 2 conductors per phase ■ Round and flat conductor connectable ■ Finger-proof	**34-58**
Flat Strip Conductor Terminals		
3	■ 1 or 2 strips per phase ■ Control circuit terminal ■ Cover for fingerproofing	**34-58**
Mechanical Interlock		
4	■ Fits between contactors	**34-56**
Overload Relays		
5	■ Can be mounted directly ■ Separate mounting, possible ■ Protection of EEx e motors ■ PTB certificate	**34-95**
Terminal Shroud		
6	■ Finger-proof	**34-58**
Auxiliary Contact Modules		
7	■ 2-pole, side mounting	**34-49**

Catalog Number Selection

Table 34-48. *XT* IEC Contactors & Starters — Catalog Numbering System

XT CE C 007 B 01 AD P16

Designation
XT = ***XT*** Line of IEC Control

Type	
CE =	3-Pole FVNR IEC Contactor
CS =	3-Pole FVNR S Series IEC Contactor
CF =	4-Pole FVNR IEC Contactor
CR =	3-Pole FVR IEC Contactor
CC =	IEC Capacitor Contactor
AE =	FVNR IEC Starter
AS =	FVNR S-Series IEC Starter
AR =	FVR IEC Starter

Terminations	
Blank =	Screw Terminals (6 – 65A); 5 mm (80 – 150A); No Lugs (185 – 2000A)
C =	Spring Cage Terminals (6 – 32A); Spring Cage Coil Terminals Only (185 – 500A)

Current Ratings, AC-3	Frame Size Designation	Built-In Auxiliary Contact
007 = 7A **009** = 9A **012** = 12A **015** = 15A	**B** = 45 mm	**01** = 1NC **10** = 1NO
018 = 18A **025** = 25A **032** = 32A	**C** = 45 mm	
040 = 40A **050** = 50A **065** = 65A	**D** = 55 mm	**00** = 0NO-0NC
080 = 80A **095** = 95A	**F** = 90 mm	
115 = 115A **150** = 150A	**G** = 90 mm	
185 = 185A **225** = 225A **250** = 250A	**L** = 140 mm	**22** = 2NO-2NC
300 = 300A **400** = 400A **500** = 500A	**M** = 160 mm	
580 = 580A **650** = 650A **750** = 750A **820** = 820A **C10** = 1000A	**N** = 250 mm	
C14 = 1400A, AC-1	**P** = 260 mm	
C16 = 1600A, AC-3 **C20** = 2000A, AC-1	**R** = 515 mm	

Coil Codes
See **Table 34-57**.

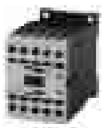
XTAE, XTAS and XTAR Starters Only — Maximum Overload Relay

XTOB Maximum Overload Rating	
Frame B **P16** = 0.1 – 0.16A **P24** = 0.16 – 0.24A **P40** = 0.24 – 0.4A **P60** = 0.4 – 0.6A **001** = 0.6 – 1A **1P6** = 1.0 – 1.6A **2P4** = 1.6 – 2.4A **004** = 2.4 – 4A **006** = 4 – 6A **010** = 6 – 10A **012** = 9 – 12A **016** = 12 – 16A	*Frame D* **010** = 6 – 10A **016** = 10 – 16A **024** = 16 – 24A **040** = 24 – 40A **057** = 40 – 57A **065** = 50 – 65A *Frame F* **035** = 25 – 35A **050** = 35 – 50A **070** = 50 – 70A **100** = 70 – 100A
Frame C **P16** = 0.1 – 0.16A **P24** = 0.16 – 0.24A **P40** = 0.24 – 0.4A **P60** = 0.4 – 0.6A **001** = 0.6 – 1A **1P6** = 1.0 – 1.6A **2P4** = 1.6 – 2.4A **004** = 2.4 – 4A **006** = 4 – 6A **010** = 6 – 10A **016** = 10 – 16A **024** = 16 – 24A **032** = 24 – 32A	*Frame G* **035** = 25 – 35A **050** = 35 – 50A **070** = 50 – 70A **100** = 70 – 100A **125** = 95 – 125A **150** = 120 – 150A *Frame L* **070** = 50 – 70A **100** = 70 – 100A **125** = 95 – 125A **160** = 120 – 160A **220** = 160 – 220A **250** = 200 – 250A

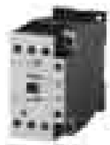
C396 Maximum Overload Rating	Suffix Std. Class 5/10/20/30
Frame B	
0.1 – 0.5A =	**3EP05**
0.4 – 2.0A =	**3E002**
1 – 5A =	**3E005**
1.6 – 8A =	**3E008**
6.4 – 32 =	**3E032**
Frame C	
0.1 – 0.5A =	**3EP05**
0.4 – 2.0A =	**3E002**
1 – 5A =	**3E005**
1.6 – 8A =	**3E008**
6.4 – 32A =	**3E032**
Frame D	
6.4 – 32A =	**3E032**
9 – 45A =	**3E045**
15 – 75A =	**3E075**
Frame F	
22 – 110A =	**3E110**
Frame G	
30 – 150A =	**3E150**

Product Selection

Non-reversing Contactors



Frame B



Frame C



Frame D



Frame F – G

Table 34-49. Full Voltage Non-reversing 3-Pole Contactors, Frame B – Frame G

I_e (A)	$I_e = I_{th}$ (A)	Maximum kW Ratings AC-3				Maximum 3-Phase Motor Rating, UL/CSA							Aux. Contacts	Catalog Number — Screw Terminals ①②	Price U.S. $	
AC-3	AC-1 (60°C)	3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings			3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V	115V	200V	230V	200V	230V	460V	575V				
Frame B																
7	20	2.2	3	4	3.5	1/4	3/4	1	1-1/2	2	3	5	1NO	**XTCE007B10_**		
7	20	2.2	3	4	3.5	1/4	3/4	1	1-1/2	2	3	5	1NC	**XTCE007B01_**		
9	20	2.5	4	5.5	4.5	1/2	1	1-1/2	3	3	5	7-1/2	1NO	**XTCE009B10_**		
9	20	2.5	4	5.5	4.5	1/2	1	1-1/2	3	3	5	7-1/2	1NC	**XTCE009B01_**		
12	20	3.5	5.5	7	6.5	1	2	2	3	3	10 ③	10	1NO	**XTCE012B10_**		
12	20	3.5	5.5	7	6.5	1	2	2	3	3	10 ③	10	1NC	**XTCE012B01_**		
15.5	20	4	7.5	8	7	1	2	3	5	5	10 ③	10	1NO	**XTCE015B10_**		
15.5	20	4	7.5	8	7	1	2	3	5	5	10 ③	10	1NC	**XTCE015B01_**		
Frame C																
18	35	5	7.5	10	11	2	2	3	5	5	10 ③	15	1NO	**XTCE018C10_**		
18	35	5	7.5	10	11	2	2	3	5	5	10 ③	15	1NC	**XTCE018C01_**		
25	40	7.5	11	14.5	14	2	3	5	7-1/2	7-1/2	15	20	1NO	**XTCE025C10_**		
25	40	7.5	11	14.5	14	2	3	5	7-1/2	7-1/2	15	20	1NC	**XTCE025C01_**		
32	40	10	15	18	17	3	5	5	10	10	20	25	1NO	**XTCE032C10_**		
32	40	10	15	18	17	3	5	5	10	10	20	25	1NC	**XTCE032C01_**		
Frame D																
40	50	12.5	18.5	24	23	3	5	7-1/2	10	15	30	40	—	**XTCE040D00_**		
50	65	15.5	22	30	30	3	7-1/2	10	15	20	40	50	—	**XTCE050D00_**		
65	80	20	30	39	35	5	10	15	20	25	50	60	—	**XTCE065D00_**		
Frame F																
80	90	25	37	48	63	7-1/2	15	15	25	30	60	75	—	**XTCE080F00_**		
95	110	30	45	57	75	7-1/2	15	15	25	40	75	100	—	**XTCE095F00_**		
Frame G																
115	130	37	55	70	90	10	25	25	40	50	100	125	—	**XTCE115G00_**		
150	160	48	75	91	96	15	25	30	40	60	125	125	—	**XTCE150G00_**		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-57, Page 34-38**.
② For Spring Cage Terminals, insert **C** after the fourth digit of the Catalog Number. Example: XTCE**C**007B10A. For 7 – 12A XTCEC Contactors, the power, auxiliary and coil terminals are spring cage. For 18 – 32A XTCEC Contactors, the auxiliary and coil terminals are spring cage. For 40 – 150A XTCEC Contactors, the coil terminals only are spring cage.
③ For electrical life contactor application data, see **Table 34-51, Page 34-35**.

Notes:

The 7 – 32A XTCE Contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

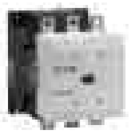
The 40 – 65A XTCE Contactors have positively driven contacts within the auxiliary contact module. 6 auxiliary contacts are possible with a combination of side mounted and front mount auxiliary contacts.

DC operated contactors (Frames B – G, 7 – 150A) have a built-in suppressor circuit.

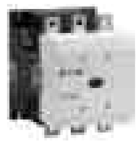
Frame B – C contactors with 1NC built-in auxiliary are mirror contacts (XTCE...B01_ – XTCE...C01_).

Contact Sequence
(Circuit Symbols) . . . . **Page 34-35**
Coil Voltage Chart . . . . **Page 34-38**
Accessories . . . . **Page 34-49**
Dimensions . . . . **Page 34-84**
Overload Relays . . . . **Page 34-95**
Discount Symbol **1CD7**

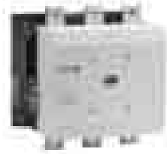
Non-reversing Contactors



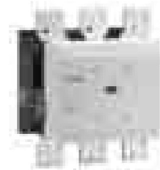
Frame L



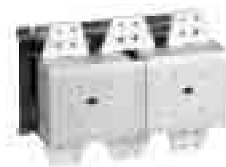
Frame M



Frame N



Frame P



Frame R

Table 34-50. Full Voltage Non-reversing 3-Pole Contactors, Frame L – Frame R

I_e (A)	$I_e = I_{th}$ (A)	Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating, UL/CSA							Aux. Contacts	Catalog Number — Screw Terminals ①	Price U.S. $	
AC-3	AC-1 (60°C)	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings			3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V ②	1000V ②	115V	200V	230V	200V	230V	460V	575V				
Frame L — Standard Coil (110/120V, 230/240V AC Coil Only)																	
185	275	55	90	110	175	108	—	—	—	50	60	125	150	2NO-2NC	**XTCS185L22_**		
225	315	70	110	132	215	108	—	—	—	60	75	150	200	2NO-2NC	**XTCS225L22_**		
250	330	75	132	148	240	108	—	—	—	75	100	200	250	2NO-2NC	**XTCS250L22_**		
Frame L — Electronic Coil																	
185	275	55	90	110	175	108	—	—	—	50	60	125	150	2NO-2NC	**XTCE185L22_**		
225	315	70	110	132	215	108	—	—	—	60	75	150	200	2NO-2NC	**XTCE225L22_**		
250	350	75	132	148	240	108	—	—	—	75	100	200	250	2NO-2NC	**XTCE250L22_**		
Frame M — Standard Coil (110/120V, 230/240V AC Coil Only)																	
300	400	90	160	180	286	132	—	—	—	100	125	250	300	2NO-2NC	**XTCS300M22_**		
400	500	125	200	240	344	132	—	—	—	125	150	300	400	2NO-2NC	**XTCS400M22_**		
500	700	155	250	300	344	132	—	—	—	150	200	400	500	2NO-2NC	**XTCS500M22_**		
Frame M — Electronic Coil																	
300	400	90	160	180	286	132	—	—	—	100	125	250	300	2NO-2NC	**XTCE300M22_**		
400	500	125	200	240	344	132	—	—	—	125	150	300	400	2NO-2NC	**XTCE400M22_**		
500	700	155	250	300	344	132	—	—	—	150	200	400	500	2NO-2NC	**XTCE500M22_**		
Frame N — Electronic Coil																	
580	800	185	315	348	560	600	—	—	—	200	200	400	600	2NO-2NC	**XTCE580N22_** ③		
650	850	205	355	390	630	600	—	—	—	200	250	500	600	2NO-2NC	**XTCE650N22_** ③		
750	900	240	400	455	720	800	—	—	—	250	300	600	700	2NO-2NC	**XTCE750N22_** ③		
820	1000	260	450	500	750	800	—	—	—	290	350	700	860	2NO-2NC	**XTCE820N22_** ③		
1000	1000	315	560	610	1000	1000	—	—	—	350	420	850	980	2NO-2NC	**XTCEC10N22_** ③		
Frame P — Electronic Coil																	
—	1400	—	—	—	—	—	—	—	—	—	—	—	—	2NO-2NC	**XTCEC14P22_** ③		
Frame R — Electronic Coil																	
1600	1800	500	900	900	1600	1700	—	—	—	560	640	1200	1300	2NO-2NC	**XTCEC16R22_** ③		
—	2000	—	—	—	—	—	—	—	—	—	—	—	—	2NO-2NC	**XTCEC20R22_** ③		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-57, Page 34-38**.
② For 185 – 500A Contactors at 660/690V or 1000V: Do not reverse directly.
③ When operating the 580 – 2000A XTCE contactors with frequency inverters, the suppressor on the load side must be removed. The load side suppressor must also be removed when performing a high-voltage test — see Pub51204, Pub51209.

Table 34-51. Contactor Application Data ④

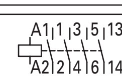
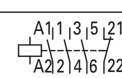
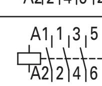
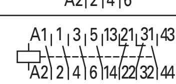
Catalog Prefix	AC-3	Electrical Life (Operations)
XTCE012B	12A	1 million
XTCE015B	15A	1.2 million
XTCE018C	18A	2 million

④ See **Page 34-82** for Electrical Life Curves.

Note:

AC and DC operated contactors have a built-in suppressor circuit (Frames L – R, 185 – 2000A).

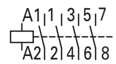
Table 34-52. Full Voltage Non-reversing 3-Pole Contactors — Contact Sequence (Circuit Symbols) — Standard Offering

Contactor Frame	Auxiliary Contacts	Contact Sequence
B – C	1NO	
B – C	1NC	
D – G	—	
L – R	2NO-2NC	

Coil Voltage Chart .... **Page 34-38**
Accessories .... **Page 34-49**
Dimensions .... **Page 34-84**
Overload Relays .... **Page 34-95**
Discount Symbol **1CD7**

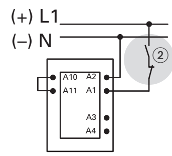
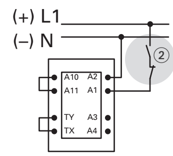
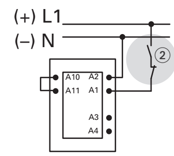
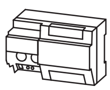
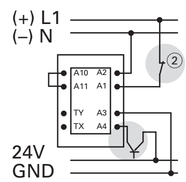
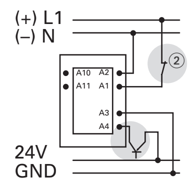
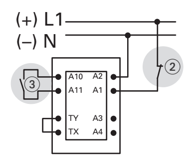
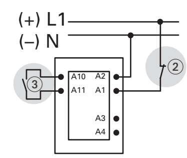
34

Table 34-53. Full Voltage 4-Pole Non-reversing Contactors with Screw Terminals

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Contact Sequence	Catalog Number ①	Price U.S. $	
AC-3	AC-1 (60°C)	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V				
12	20	3.5	5.5		6.5	—	1/2	1-1/2	3	3	5	7-1/2		XTCF020B00_		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-58**.

Table 34-54. Controlling XTCS and XTCE Contactors Frame L – R (185 – 2000A)

Description	XTCS185L – XTCS500M	XTCEC16R, XTCEC20R	XTCE185L – XTCEC14P
Conventional A1/A2 are applied to voltage in the usual manner.			
Direct from the PLC A 24V output from the PLC can be connected directly to connections A3/A4. 	—		
From Low-Consumption Command Devices Command devices which can only be subject to minimal loads such as circuit board relays, control circuit devices or position switches can be connected directly to A10/A11.	—		

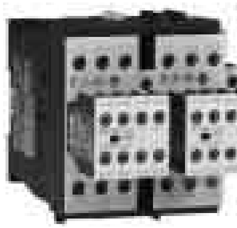
② Standstill in an emergency (Emergency-Stop).
③ Command device connection.

Discount Symbol **1CD7**

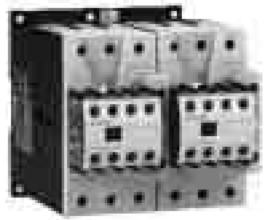
Reversing Contactors



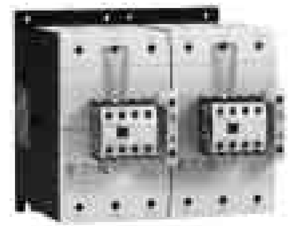
Frame B



Frame C



Frame D



Frame F and G

Table 34-55. Full Voltage Reversing Contactors with Screw Terminals

I_e (A)	Maximum kW Ratings AC-3				Maximum 3-Phase Motor Rating						Spare Auxiliary Contacts		Catalog Number ①	Price U.S. $	
AC-3	3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings		3-Phase hp Ratings				K1M	K2M		AC Coil	DC Coil
	220/ 230V	380/ 400V	415V	660/ 690V	115V	230V	200V	230V	460V	575V					
Frame B															
7	2.2	3	4	3.5	1/4	1	1-1/2	2	3	5	63/64	63/64	**XTCR007B21_**		
9	2.5	4	5.5	4.5	1/2	1-1/2	2	3	5	7-1/2	63/64	63/64	**XTCR009B21_**		
12	3.5	5.5	7	6.5	1/2	2	3	3	7-1/2	10	63/64	63/64	**XTCR012B21_**		
Frame C															
18	5	7.5	8	11	2	3	5	5	10	15	63/64	63/64	**XTCR018C21_**		
25	7.5	11	14.5	14	2	5	7-1/2	7-1/2	15	20	63/64	63/64	**XTCR025C21_**		
32	10	15	18	17	3	5	10	10	20	25	63/64	63/64	**XTCR032C21_**		
Frame D															
40	12.5	18.5	24	23	3	7-1/2	10	15	30	40	—	—	**XTCR040D11_**		
50	15.5	22	30	30	3	10	15	20	40	50	—	—	**XTCR050D11_**		
65	20	30	39	35	5	15	20	25	50	60	—	—	**XTCR065D11_**		
Frame F															
80	25	37	48	63	7-1/2	15	25	30	60	75	—	—	**XTCR080F11_**		
95	30	45	57	75	7-1/2	15	25	40	75	100	—	—	**XTCR095F11_**		
Frame G															
115	37	55	70	90	10	25	40	50	100	100	—	—	**XTCR115G11_**		
150	48	75	91	96	15	30	40	60	100	100	—	—	**XTCR150G11_**		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-57**.

Table 34-56. XTCR Reversing Contactor Components

Qty	Frame	B	C	D	F	G
2	Contactor	XTCE...B01_	XTCE...B01_	XTCE...D00_	XTCE...F00_	XTCE...G00_
2	Auxiliary Contact	XTCEXFAC20	XTCEXFAC20	XTCEXFBG11	XTCEXFBG11	XTCEXFBG11
1	Mechanical Interlock	XTCEXMLB	XTCEXMLC	XTCEXMLD	XTCEXMLG	XTCEXMLG
1	Reversing Link Kit	XTCEXRLB	XTCEXRLC	XTCEXRLD	XTCEXRLG	XTCEXRLG

Coil Voltage Chart .... **Page 34-38**
Accessories .... **Page 34-49**
Dimensions .... **Page 34-84**
Overload Relays .... **Page 34-95**
Discount Symbol **1CD7**

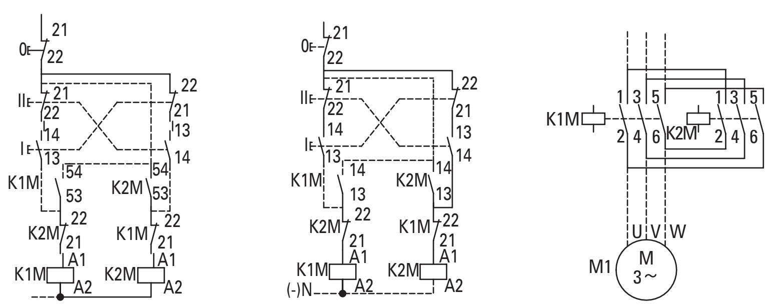
Table 34-57. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
120V DC	**AD**
220V DC	**BD**
12V DC	**RD**
48V DC	**WD**

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
12 – 14V DC	**RD** ①
48 – 60V DC	**WD**

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
480 – 500V 50/60 Hz	**C**
380 – 440V 50/60 Hz	**L**
42 – 48V 50/60 Hz	**W**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
48 – 60V DC	**WD**
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz	**C**
48 – 110V 40 – 60 Hz/DC	**Y**
24 – 48V DC	**TD** ②
Frame L – M, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

① Frame C – D only.
② Frame L – M only.



7 – 32A

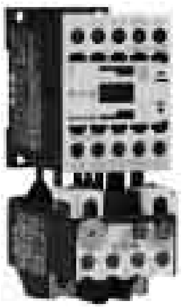
40 – 150A

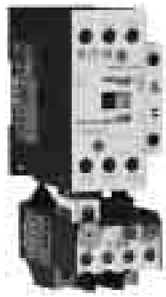
7 – 150A with Mechanical Interlock 80 – 150A on Mounting Plate

Figure 34-34. 7 – 150A XTCR Reversing Contactor Wiring Diagram

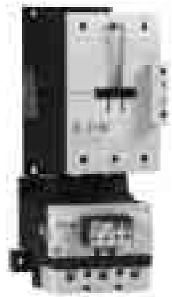
Accessories .... **Page 34-49**
Dimensions .... **Page 34-84**
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Non-reversing Starters, Bimetallic Overload


Frame B


Frame C


Frame D


Frame F/G

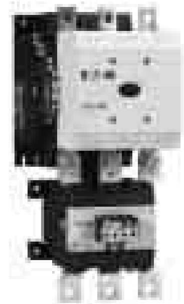

Frame L

Table 34-58. Full Voltage Non-reversing 3-Pole Starters with Bimetallic Overload

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Auxiliary Contacts	Catalog Number ①②	Price U.S. $	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings						AC Coil	DC Coil
		220/ 230V	380/ 400V	415V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V				
Frame B																
7	20	2.2	3	4	3.5	—	1/4	1	1-1/2	2	3	5	1NO	**XTAE007B10_ _**		
7	20	2.2	3	4	3.5	—	1/4	1	1-1/2	2	3	5	1NC	**XTAE007B01_ _**		
9	20	2.5	4	5.5	4.5	—	1/2	1-1/2	3	3	5	7-1/2	1NO	**XTAE009B10_ _**		
9	20	2.5	4	5.5	4.5	—	1/2	1-1/2	3	3	5	7-1/2	1NC	**XTAE009B01_ _**		
12	20	3.5	5.5	7	6.5	—	1	2	3	3	10 ③	10	1NO	**XTAE012B10_ _**		
12	20	3.5	5.5	7	6.5	—	1	2	3	3	10 ③	10	1NC	**XTAE012B01_ _**		
15.5	20	4	7.5	8	7	—	1	3	5	5	10 ③	10	1NO	**XTAE015B10_ _**		
15.5	20	4	7.5	8	7	—	1	3	5	5	10 ③	10	1NC	**XTAE015B01_ _**		
Frame C																
18	35	5	7.5	10	11	—	2	3	5	5	10 ③	15	1NO	**XTAE018C10_ _**		
18	35	5	7.5	10	11	—	2	3	5	5	10 ③	15	1NC	**XTAE018C01_ _**		
25	40	7.5	11	14.5	14	—	2	5	7-1/2	7-1/2	15	20	1NO	**XTAE025C10_ _**		
25	40	7.5	11	14.5	14	—	2	5	7-1/2	7-1/2	15	20	1NC	**XTAE025C01_ _**		
32	40	10	15	18	17	—	3	5	10	10	20	25	1NO	**XTAE032C10_ _**		
32	40	10	15	18	17	—	3	5	10	10	20	25	1NC	**XTAE032C01_ _**		
Frame D																
40	50	12.5	18.5	24	23	—	3	7-1/2	10	15	30	40	—	**XTAE040D00_ _**		
50	60	15.5	22	30	30	—	3	10	15	20	40	50	—	**XTAE050D00_ _**		
65	72	20	30	39	35	—	5	15	20	25	50	60	—	**XTAE065D00_ _**		
Frame F																
80	110	25	37	48	63	—	7-1/2	15	25	30	60	75	—	**XTAE080F00_ _**		
95	110	30	45	57	75	—	7-1/2	15	25	40	75	100	—	**XTAE095F00_ _**		
Frame G																
115	160	37	55	70	105	—	10	25	40	50	100	125	—	**XTAE115G00_ _**		
150	160	48	75	91	125	—	15	30	40	60	125	125	—	**XTAE150G00_ _**		
Frame L																
185	275	55	90	110	175	108	—	—	50	60	125	150	2NO-2NC	**XTAE185L22_ _**		
225	315	70	110	132	215	108	—	—	60	75	150	200	2NO-2NC	**XTAE225L22_ _**		
250	350	75	132	148	240	108	—	—	75	100	200	250	2NO-2NC	**XTAE250L22_ _**		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-61**.
② Underscore (_) indicates overload relay suffix required. See **Table 34-63**.
③ For electrical life contactor application data see **Table 34-62**.

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Accessories .... **Page 34-49**
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Discount Symbol **1CD7**

Table 34-59. Full Voltage Non-reversing S-Series 3-Pole Starters with Bimetallic Overload

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Catalog Number ①②	Price U.S. $	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings					AC Coil	DC Coil
		220/230V	380/400V	415V	660/690V	1000V	115V	230V	200V	230V	460V	575V			
Frame L															
185	337	55	90	110	175	108	—	—	50	60	125	150	**XTAS185L22_ _**		
225	386	70	110	132	215	108	—	—	60	75	150	200	**XTAS225L22_ _**		
250	429	75	132	148	240	108	—	—	75	100	200	250	**XTAS250L22_ _**		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-61**.
② Underscore (_) indicates overload relay suffix required. See **Table 34-63**.

Reversing Starters, Bimetallic Overload

Table 34-60. Full Voltage Reversing Starters with Screw Terminals and Bimetallic Overload

I_e (A)	Maximum kW Ratings AC-3				Maximum 3-Phase Motor Rating						Catalog Number ③④	Price U.S. $	
AC-3	3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings		3-Phase hp Ratings					AC Coil	DC Coil
	220/230V	380/400V	415V	660/690V	115V	230V	200V	230V	460V	575V			
Frame B													
7	2.2	3	4	3.5	1/4	1	1-1/2	2	3	5	**XTAR007B21_ _**		
9	2.5	4	5.5	4.5	1/2	1-1/2	3	3	5	7-1/2	**XTAR009B21_ _**		
12	3.5	5.5	7	6.5	1	2	3	3	10	10	**XTAR012B21_ _**		
Frame C													
18	5	7.5	8	11	2	3	5	5	10	15	**XTAR018C21_ _**		
25	7.5	11	14.5	14	2	5	7-1/2	7-1/2	15	20	**XTAR025C21_ _**		
32	10	15	18	17	3	5	10	10	20	25	**XTAR032C21_ _**		
Frame D													
40	12.5	18.5	24	23	3	7-1/2	10	15	30	40	**XTAR040D11_ _**		
50	15.5	22	30	30	3	10	15	20	40	50	**XTAR050D11_ _**		
65	20	30	39	35	5	15	20	25	50	60	**XTAR065D11_ _**		

③ Underscore (_) indicates magnet coil suffix required. See **Table 34-61**.
④ Underscore (_) indicates overload relay suffix required. See **Table 34-63**.

Table 34-61. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
120V DC	**AD**
220V DC	**BD**
12V DC	**RD**
48V DC	**WD**

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
12 – 14V DC	**RD** ⑥
48 – 60V DC	**WD**

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
480 – 500V 50/60 Hz	**C**
380 – 440V 50/60 Hz	**L**
42 – 48V 50/60 Hz	**W**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
48 – 60V DC	**WD**
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz	**C**
48 – 110V 40 – 60 Hz/DC	**Y**
24 – 48V DC	**TD** ⑦
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

⑥ Frame C – D only.
⑦ Frame L – M only.

Table 34-62. Starter Application Data ⑤

Catalog Prefix	AC-3	Electrical Life (Operations)
XTAE012B	12A	1 million
XTAE015B	15A	1.2 million
XTAE018C	18A	2 million

⑤ See **Page 34-82** for Electrical Life Curves.

Accessories .... **Page 34-49**
Dimensions .... **Page 34-84**
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Discount Symbol **1CD7**

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Table 34-63. XTOB and XTOT Overload Relay Suffix

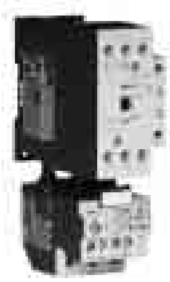
Motor Full Load Amperes	Suffix Code	For Use with Contactor Amp Range	Overload Relay Catalog Number
Frame B			
0.1 – 0.16	**P16**	7 – 15A	**XTOBP16BC1**
0.16 – 0.24	**P24**	7 – 15A	**XTOBP24BC1**
0.24 – 0.4	**P40**	7 – 15A	**XTOBP40BC1**
0.4 – 0.6	**P60**	7 – 15A	**XTOBP60BC1**
0.6 – 1	**001**	7 – 15A	**XTOB001BC1**
1 – 1.6	**1P6**	7 – 15A	**XTOB1P6BC1**
1.6 – 2.4	**2P4**	7 – 15A	**XTOB2P4BC1**
2.4 – 4	**004**	7 – 15A	**XTOB004BC1**
4 – 6	**006**	7 – 15A	**XTOB006BC1**
6 – 10	**010**	7 – 15A	**XTOB010BC1**
9 – 12	**012**	9 – 15A	**XTOB012BC1**
12 – 16	**016**	12 – 15A	**XTOB016BC1**
Frame C			
0.1 – 0.16	**P16**	18 – 32A	**XTOBP16CC1**
0.16 – 0.24	**P24**	18 – 32A	**XTOBP24CC1**
0.24 – 0.4	**P40**	18 – 32A	**XTOBP40CC1**
0.4 – 0.6	**P60**	18 – 32A	**XTOBP60CC1**
0.6 – 1	**001**	18 – 32A	**XTOB001CC1**
1 – 1.6	**1P6**	18 – 32A	**XTOB1P6CC1**
1.6 – 2.4	**2P4**	18 – 32A	**XTOB2P4CC1**
2.4 – 4	**004**	18 – 32A	**XTOB004CC1**
4 – 6	**006**	18 – 32A	**XTOB006CC1**
6 – 10	**010**	18 – 32A	**XTOB010CC1**
10 – 16	**016**	18 – 32A	**XTOB016CC1**
16 – 24	**024**	18 – 32A	**XTOB024CC1**
24 – 32	**032**	25 – 32A	**XTOB032CC1**

① Catalog Number refers to direct mount overload relay. Add an **S** to the end of the Catalog Number for separate mount.

Motor Full Load Amperes	Suffix Code	For Use with Contactor Amp Range	Overload Relay Catalog Number
Frame D			
6 – 10	**010**	40 – 65A	**XTOB010DC1**
10 – 16	**016**	40 – 65A	**XTOB016DC1**
16 – 24	**024**	40 – 65A	**XTOB024DC1**
24 – 40	**040**	40 – 65A	**XTOB040DC1**
40 – 57	**057**	50 – 65A	**XTOB057DC1**
50 – 65	**065**	65A	**XTOB065DC1**
Frame F			
25 – 35	**035**	80 – 95A	**XTOB055GC1** ①
35 – 50	**050**	80 – 95A	**XTOB050GC1** ①
50 – 70	**070**	80 – 95A	**XTOB070GC1** ①
70 – 100	**100**	80 – 95A	**XTOB100GC1** ①
Frame G			
25 – 35	**035**	115 – 150A	**XTOB055GC1** ①
35 – 50	**050**	115 – 150A	**XTOB050GC1** ①
50 – 70	**070**	115 – 150A	**XTOB070GC1** ①
70 – 100	**100**	115 – 150A	**XTOB100GC1** ①
95 – 125	**125**	115 – 150A	**XTOB125GC1** ①
120 – 150	**150**	150A	**XTOB150GC1** ①
Frame L			
50 – 70	**070**	185 – 250A	**XTOB070LC1**
70 – 100	**100**	185 – 250A	**XTOB100LC1**
95 – 125	**125**	185 – 250A	**XTOB125LC1**
120 – 160	**160**	185 – 250A	**XTOB160LC1**
160 – 220	**220**	185 – 250A	**XTOB220LC1**
200 – 250	**250**	225 – 250A	**XTOB250LC1**

Overload Relays . . . . **Page 34-95**

Non-reversing Starters, C396 Electronic Overload



Frame C XT Starter with C396 Electronic Overload

Table 34-64. Full Voltage Non-reversing 3-Pole Starters with C396 Electronic Overload

I_e (A)		Maximum kW Ratings AC-3					Maximum 3-Phase Motor Rating						Auxiliary Contacts	Catalog Number ①②	Price U.S. $	
AC-3	AC-1	3-Phase Motors 50 – 60 Hz					1-Phase hp Ratings		3-Phase hp Ratings						Standard	
		220/ 230V	380/ 400V	415V	660/ 690V	1000V	115V	230V	200V	230V	460V	575V			AC Coil	DC Coil
Frame B																
7	20	2.2	3	4	3.5	—	1/4	1	1-1/2	2	3	5	1NO	**XTAE007B10_ _**		
7	20	2.2	3	4	3.5	—	1/4	1	1-1/2	2	3	5	1NC	**XTAE007B01_ _**		
9	20	2.5	4	5.5	4.5	—	1/2	1-1/2	3	3	5	7-1/2	1NO	**XTAE009B10_ _**		
9	20	2.5	4	5.5	4.5	—	1/2	1-1/2	3	3	5	7-1/2	1NC	**XTAE009B01_ _**		
12	20	3.5	5.5	7	6.5	—	1	2	3	3	10 ③	10	1NO	**XTAE012B10_ _**		
12	20	3.5	5.5	7	6.5	—	1	2	3	3	10 ③	10	1NC	**XTAE012B01_ _**		
15.5	20	4	7.5	8	7	—	1	3	5	5	10 ③	10	1NO	**XTAE015B10_ _**		
15.5	20	4	7.5	8	7	—	1	3	5	5	10 ③	10	1NC	**XTAE015B01_ _**		
Frame C																
18	35	5	7.5	10	11	—	2	3	5	5	10 ③	15	1NO	**XTAE018C10_ _**		
18	35	5	7.5	10	11	—	2	3	5	5	10 ③	15	1NC	**XTAE018C01_ _**		
25	40	7.5	11	14.5	14	—	2	5	7-1/2	7-1/2	15	20	1NO	**XTAE025C10_ _**		
25	40	7.5	11	14.5	14	—	2	5	7-1/2	7-1/2	15	20	1NC	**XTAE025C01_ _**		
32	40	10	15	18	17	—	3	5	10	10	20	25	1NO	**XTAE032C10_ _**		
32	40	10	15	18	17	—	3	5	10	10	20	25	1NC	**XTAE032C01_ _**		
Frame D																
40	50	12.5	18.5	24	23	—	3	7-1/2	10	15	30	40	—	**XTAE040D00_ _**		
50	60	15.5	22	30	30	—	3	10	15	20	40	50	—	**XTAE050D00_ _**		
65	72	20	30	39	35	—	5	15	20	25	50	60	—	**XTAE065D00_ _**		
Frame F																
80	110	25	37	48	63	—	7-1/2	15	25	30	60	75	—	**XTAE080F00_ _**		
95	110	30	45	57	75	—	7-1/2	15	25	40	75	100	—	**XTAE095F00_ _**		
Frame G																
115	160	37	55	70	105	—	10	25	40	50	100	125	—	**XTAE115G00_ _**		
150	160	48	75	91	125	—	15	30	40	60	125	125	—	**XTAE150G00_ _**		

① Underscore (_) indicates magnet coil suffix required. See **Table 34-66**.
② Underscore (_) indicates overload relay suffix required. See **Table 34-68**.
③ For electrical life contactor application data see **Table 34-67**.

Reversing Starters, C396 Electronic Overload

Table 34-65. Full Voltage Reversing Starters with Screw Terminals and C396 Electronic Overload

I_e (A)	Maximum kW Ratings AC-3				Maximum 3-Phase Motor Rating						Catalog Number ④⑤	Price U.S. $	
AC-3	3-Phase Motors 50 – 60 Hz				1-Phase hp Ratings		3-Phase hp Ratings					Standard	
	220/ 230V	380/ 400V	415V	660/ 690V	115V	230V	200V	230V	460V	575V		AC Coil	DC Coil
Frame B													
7	2.2	3	4	3.5	1/4	1	1-1/2	2	3	5	**XTAR007B21_ _**		
9	2.5	4	5.5	4.5	1/2	1-1/2	3	3	5	7-1/2	**XTAR009B21_ _**		
12	3.5	5.5	7	6.5	1	2	3	3	10	10	**XTAR012B21_ _**		
Frame C													
18	5	7.5	8	11	2	3	5	5	10	15	**XTAR018C21_ _**		
25	7.5	11	14.5	14	2	5	7-1/2	7-1/2	15	20	**XTAR025C21_ _**		
32	10	15	18	17	3	5	10	10	20	25	**XTAR032C21_ _**		
Frame D													
40	12.5	18.5	24	23	3	7-1/2	10	15	30	40	**XTAR040D11_ _**		
50	15.5	22	30	30	3	10	15	20	40	50	**XTAR050D11_ _**		
65	20	30	39	35	5	15	20	25	50	60	**XTAR065D11_ _**		

④ Underscore (_) indicates magnet coil suffix required. See **Table 34-66**.
⑤ Underscore (_) indicates overload relay suffix required. See **Table 34-68**.

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Discount Symbol **1CD7**

Table 34-66. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
120V DC	**AD**
220V DC	**BD**
12V DC	**RD**
48V DC	**WD**

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
12 – 14V DC	**RD** ①
48 – 60V DC	**WD**

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
480 – 500V 50/60 Hz	**C**
380 – 440V 50/60 Hz	**L**
42 – 48V 50/60 Hz	**W**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
48 – 60V DC	**WD**
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz	**C**
48 – 110V 40 – 60 Hz/DC	**Y**
24 – 48V DC	**TD** ②
Frame L – N, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

① Frame C – D only.
② Frame L – M only.

Table 34-67. Starter Application Data ③

Catalog Prefix	AC-3	Electrical Life (Operations)
XTAE012B	12A	1 million
XTAE015B	15A	1.2 million
XTAE018C	18A	2 million

③ See **Page 34-82** for Electrical Life Curves.

Table 34-68. C396 Overload Relay Suffix ④

FLA Range (Amps)	Suffix Std. Class 5/10/20/30	For Use with *XT* IEC Contactor Frame Size / Width	Catalog Number Standard Class 5/10/20/30
45 mm Overload Frame Size			
0.1 – 0.5	**3EP05**	B / 45 mm	**C396A2AP05SELXB**
0.4 – 2.0	**3E002**	B / 45 mm	**C396A2A002SELXB**
1 – 5	**3E005**	B / 45 mm	**C396A2A005SELXB**
1.6 – 8	**3E008**	B / 45 mm	**C396A2A008SELXB**
6.4 – 32	**3E032**	B / 45 mm	**C396A2A032SELXB**
0.1 – 0.5	**3EP05**	C / 45 mm	**C396A2AP05SELXC**
0.4 – 2.0	**3E002**	C / 45 mm	**C396A2A002SELXC**
1 – 5	**3E005**	C / 45 mm	**C396A2A005SELXC**
1.6 – 8	**3E008**	C / 45 mm	**C396A2A008SELXC**
6.4 – 32	**3E032**	C / 45 mm	**C396A2A032SELXC**
6.4 – 32	**3E032**	D / 55 mm	**C396A2A032SELXD**
9 – 45	**3E045**	D / 55 mm	**C396A2A045SELXD**
65 mm Overload Frame Size			
15 – 75	**3E075**	D / 55 mm	**C396B2A075SELXD**
22 – 110	**3E110**	F – G / 90 mm	**C396B2A110SELXF**
110 mm Overload Frame Size			
30 – 150	**3E150**	G / 90 mm	**C396C2A150SELAX** ⑤

④ Product available May 2007.
⑤ Catalog Number listed is for Stand-Alone Overload Relay. For direct connection of 110 mm C396 to Frame G ***XT*** Contactors use 110 mm ***XT*** Bus Bar Kit, C396CBARXT.

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Dimensions .... **Page 34-84**
Overload Relays .... **Page 34-104**
Discount Symbol **1CD7**

Star-Delta (Wye-Delta) Starters

Table 34-69. Star-Delta (Wye-Delta) Starters

I_e (A)	Maximum kW Ratings AC-3						Maximum 3-Phase Current Motor Rating				Maximum Changeover Time (sec)	Components	
AC-3	3-Phase Motors 50 – 60 Hz						3-Phase hp Ratings					Description	Catalog Number ①
	220/ 230V	380/ 400V	415V	500V	660/ 690V	1000V	200V	230V	460V	575V			
Frame B													
12	3	5.5	7	5.5	5.5	—	3	3	2-1/2	10	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (3) Auxiliary Contacts Star-Delta Link Kit	**XTCE007B10_** **XTCE007B01_** **XTCE007B01_** **XTCEXMLB** **XTTR6A60S51B** **XTOB…BC1** **XTCEXFAC20** **XTCEXSDLB**
16	4	7.5	8	7.5	7.5	—	3	5	7-1/2	10	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (3) Auxiliary Contacts Star-Delta Link Kit	**XTCE009B10_** **XTCE009B01_** **XTCE009B01_** **XTCEXMLB** **XTTR6A60S51B** **XTOB…BC1** **XTCEXFAC20** **XTCEXSDLB**
22	5.5	11	14.5	11	11	—	5	5	10	15	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (3) Auxiliary Contacts Star-Delta Link Kit	**XTCE012B10_** **XTCE012B01_** **XTCE012B01_** **XTCEXMLB** **XTTR6A60S51B** **XTOB…BC1** **XTCEXFAC20** **XTCEXSDLB**
Frame C													
30	7.5	15	19	18.5	18.5	—	7-1/2	7-1/2	15	20	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (3) Auxiliary Contacts Star-Delta Link Kit	**XTCE018C10_** **XTCE018C01_** **XTCE018C01_** **XTCEXMLC** **XTTR6A60S51B** **XTOB…CC1** **XTCEXFAC20** **XTCEXSDLC**
45	11	22	30	30	22	—	10	15	30	40	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (3) Auxiliary Contacts Star-Delta Link Kit	**XTCE025C10_** **XTCE025C01_** **XTCE025C01_** **XTCEXMLC** **XTTR6A60S51B** **XTOB…CC1** **XTCEXFAC20** **XTCEXSDLC**
55	15	30	39	37	30	—	15	20	40	50	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (3) Auxiliary Contacts Star-Delta Link Kit	**XTCE032C10_** **XTCE032C01_** **XTCE032C01_** **XTCEXMLC** **XTTR6A60S51B** **XTOB…CC1** **XTCEXFAC20** **XTCEXSDLC**
Frame D													
70	18.5	37	37	45	37	—	20	25	50	60	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (2) Auxiliary Contacts (K1M, K3M) (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE040D00_** **XTCE040D00_** **XTCE040D00_** **XTCEXMLD** **XTTR6A60S51B** **XTOB…DC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLD**
90	22	45	45	55	45	—	25	30	60	75	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (2) Auxiliary Contacts (K1M, K3M) (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE050D10_** **XTCE050D00_** **XTCE040D00_** **XTCEXMLD** **XTTR6A60S51B** **XTOB…DC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLD**

① Underscore (_) indicates magnet coil suffix required. See **Table 34-71**.

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Table 34-69. Star-Delta (Wye-Delta) Starters (Continued)

I_e (A)	Maximum kW Ratings AC-3						Maximum 3-Phase Current Motor Rating				Maximum Changeover Time (sec)	Components	
AC-3	3-Phase Motors 50 – 60 Hz						3-Phase hp Ratings					Description	Catalog Number ①
	220/ 230V	380/ 400V	415V	500V	660/ 690V	1000V	200V	230V	460V	575V			
Frame D (Continued)													
115	30	55	55	75	55	—	40	50	100	125	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (2) Auxiliary Contacts (K1M, K3M) (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE065D10_** **XTCE065D00_** **XTCE040D00_** **XTCEXMLD** **XTTR6A60S51B** **XTOB…DC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLD**
Frame F													
140	37	75	75	90	90	—	40	60	125	150	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② Mechanical Interlock ② K1T Timing Relay Overload Relay (2) Auxiliary Contacts (K1M, K3M) (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE080F00_** **XTCE080F00_** **XTCE050D00_** **XTCEXMLG** **XTTR6A60S51B** **XTOB…FC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLF**
165	45	90	110	110	132	—	40	60	125	150	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② Mechanical Interlock ② K1T Timing Relay Overload Relay (2) Auxiliary Contacts (K1M, K3M) (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE095F00_** **XTCE095F00_** **XTCE065D00_** **XTCEXMLG** **XTTR6A60S51B** **XTOB…FC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLF**
Frame G													
200	55	110	132	132	160	—	50	60	125	150	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (2) Auxiliary Contacts (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE115G00_** **XTCE115G00_** **XTCE080F00_** **XTCEXMLG** **XTTR6A60S51B** **XTOB…GC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLG**
260	75	132	148	160	160	—	75	100	200	250	< 20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay (2) Auxiliary Contacts (1) Auxiliary Contact (K5M) Star-Delta Link Kit	**XTCE150G00_** **XTCE150G00_** **XTCE080F00_** **XTCEXMLG** **XTTR6A60S51B** **XTOB…GC1** **XTCEXFBG11** **XTCEXFBG31** **XTCEXSDLG**
Frame L													
315	90	160	180	200	250	132	100	125	250	300	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② Mechanical Interlock ② K1T Timing Relay Overload Relay K3M Auxiliary Contact Star-Delta Link Kit	**XTCE185L22_** **XTCE185L22_** **XTCE115G00_** **XTCEXMLM** **XTTR6A60S51B** **XTOB…LC1** **XTCEXFBG22** **XTCEXSDLL225**
385	110	200	240	250	315	160	125	150	300	400	<20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② Mechanical Interlock ② K1T Timing Relay Overload Relay K3M Auxiliary Contact Star-Delta Link Kit	**XTCE225L22_** **XTCE225L22_** **XTCE150G00_** **XTCEXMLM** **XTTR6A60S51B** **XTOB…LC1** **XTCEXFBG22** **XTCEXSDLL225**
430	132	250	300	315	400	200	125	150	300	400	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay Star-Delta Link Kit	**XTCE250L22_** **XTCE250L22_** **XTCE185L22_** **XTCEXMLM** **XTTR6A60S51B** **XTOB…LC1** **XTCEXSDLL250**

① Underscore (_) indicates magnet coil suffix required. See **Table 34-71**.
② If mechanical interlock of Star Contactor is required, it must be the same frame size of the Delta Contactor or use the same mechanical interlock, see **Table 34-86**, **Page 34-56** for mechanical interlocks. (Example: XTCE...L22_ and XTCE...M22_ both use Mechanical Interlock XTCEXMLM.)

Table 34-69. Star-Delta (Wye-Delta) Starters (Continued)

I_e (A)	Maximum kW Ratings AC-3						Maximum 3-Phase Current Motor Rating				Maximum Changeover Time (sec)	Components	
AC-3	3-Phase Motors 50 – 60 Hz						3-Phase hp Ratings					Description	Catalog Number ①
	220/ 230V	380/ 400V	415V	500V	660/ 690V	1000V	200V	230V	460V	575V			
Frame M													
515	160	300	348	355	450	200	150	200	400	500	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay Star-Delta Link Kit	**XTCE300M22_** **XTCE300M22_** **XTCE185L22_** **XTCEXMLM** **XTTR6A60S51B** **XTOT…C3S** **XTCEXSDLM400**
685	200	355	390	450	560	220	200	250	500	600	<20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay Star-Delta Link Kit	**XTCE400M22_** **XTCE400M22_** **XTCE250L22_** **XTCEXMLM** **XTTR6A60S51B** **XTOT…C3S** **XTCEXSDLM400**
860	250	450	500	560	600	220	290	350	700	860	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay	**XTCE500M22_** **XTCE500M22_** **XTCE300M22_** **XTCEXMLM** **XTTR6A60S51B** **XTOT…C3S**
Frame N													
1000	300	560	610	710	900	355	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② Mechanical Interlock ② K1T Timing Relay Overload Relay	**XTCE580N22_** **XTCE580N22_** **XTCE400M22_** **XTCEXMLN** **XTTR6A60S51B** **XTOT…C3S**
1120	350	630	680	750	950	355	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor ② Mechanical Interlock ② K1T Timing Relay Overload Relay	**XTCE650N22_** **XTCE650N22_** **XTCE400M22_** **XTCEXMLN** **XTTR6A60S51B** **XTOT…C3S**
1290	400	710	760	900	1200	1400	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay	**XTCE750N22_** **XTCE750N22_** **XTCE580N22_** **XTCEXMLN** **XTTR6A60S51B** **XTOT…C3S**
1400	450	800	850	950	1300	1400	—	—	—	—	<30	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay	**XTCE820N22_** **XTCE820N22_** **XTCE580N22_** **XTCEXMLN** **XTTR6A60S51B** **XTOT…C3S**
1700	560	1000	1050	1200	1700	1700	—	—	—	—	<20	K1M Main Contactor K5M Delta Contactor K3M Star Contactor Mechanical Interlock K1T Timing Relay Overload Relay	**XTCEC10N22_** **XTCEC10N22_** **XTCE650N22_** **XTCEXMLN** **XTTR6A60S51B** **XTOT…C3S**

① Underscore (_) indicates magnet coil suffix required. See **Table 34-71**.

② If mechanical interlock of Star contactor is required, it must be the same frame size of the Delta contactor or use the same mechanical interlock, see **Table 34-86, Page 34-56** for mechanical interlocks. (Example: XTCE...L22_ and XTCE...M22_ both use Mechanical Interlock XTCEXMLM.)

Table 34-70. Spare Auxiliary Contacts

AC-3	K1M	K3M	K5M
12 – 55	63 / 64	63 / 64	63 / 64
90 – 260	21 33 / 22 34	—	—
315 – 1700	21 31 / 22 32	31 43 / 32 44	31 43 / 32 44

Notes:

Main Circuit: Depending on the coordination type required (i.e. Type 1 or Type 2) it must be established whether the fuse protection and the input wiring for the main and delta contactors are to be common or separate.

Control Circuit: If the combinations are used in the scope of the IEC/EN 60 204-1, VDE 0113 part 1, point 9.1.1 regarding the supply of control circuits is to be observed.

Coil Voltage Chart .... **Page 34-47**
Accessories .... **Page 34-49**
Dimensions .... **Page 34-84**
Overload Relays .... **Page 34-95**
Discount Symbol **1CD7**

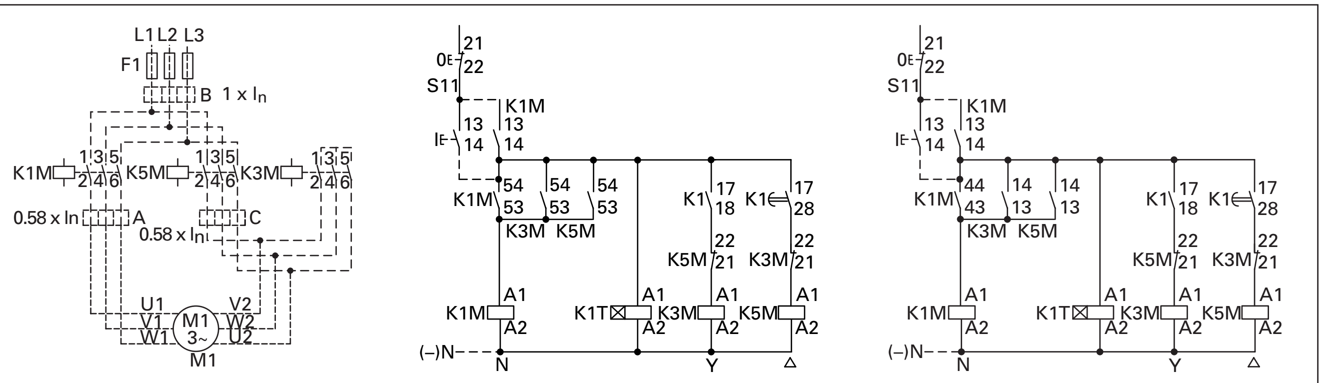
Table 34-71. Magnet Coil Suffix

Coil Voltage	Suffix Code
Frame A – B	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
120V DC	**AD**
220V DC	**BD**
12V DC	**RD**
48V DC	**WD**

Coil Voltage	Suffix Code
Frame C – F	
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**
380V 60 Hz	**P**
12V 50/60 Hz	**R**
24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
12 – 14V DC	**RD** ①
48 – 60V DC	**WD**

Coil Voltage	Suffix Code
Frame G	
100 – 120V 50/60 Hz	**A**
190 – 240V 50/60 Hz	**B**
24V 50/60 Hz	**T**
24 – 27V DC	**TD**
480 – 500V 50/60 Hz	**C**
380 – 440V 50/60 Hz	**L**
42 – 48V 50/60 Hz	**W**
110 – 130V DC	**AD**
200 – 240V DC	**BD**
48 – 60V DC	**WD**
Frame L – N	
110 – 250V 40 – 60 Hz/DC	**A**
250 – 500V 40 – 60 Hz	**C**
48 – 110V 40 – 60 Hz/DC	**Y**
24 – 48V DC	**TD**
Frame L – M, S-Series	
110 – 120V 50/60 Hz	**A**
220 – 240V 50/60 Hz	**B**
Frame P – R	
220 – 250V 50 – 60 Hz/DC	**B**

① Frame C – D only.



12 – 385A AC-3   *12 – 55A AC-3*   *70 – 1700A AC-3*

Overload Relay Settings (A)

Setting	Starting
A: I_N x 0.58 Motor Protection in the Star (Wye) and Delta Configurations	≤ 15 sec
B: I_N x 1 Only partial motor protection in Star position	15 – 40 sec
C: I_N x 0.58 Motor not protected in Star (Wye) position	> 40 sec
Timing Relay set to approximately 10 sec	

Figure 34-35. Wiring Diagrams

Overload Relays . . . . Page 34-95

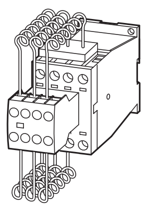
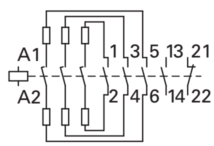
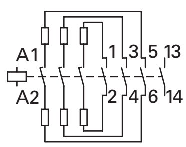


Table 34-72. XTCC Contactors for Three-Phase Capacitors

Three-Phase Capacitors, 50 – 60 Hz Open kVar Ratings ①				Contact Sequence	Catalog Number ②③	Price U.S. $
230V	400V	525V	690V			
7.5	12.5	16.7	20		XTCC012B11_	
11	20	25	33.3		XTCC020C11_	
15	25	33.3	40		XTCC025C11_	
20	33.3	40	55		XTCC033D10_	
25	50	65	85		XTCC050D10_	

① With series resistors, without quick-discharge resistor.
② Underscore (_) indicates magnet coil suffix required, see **Table 34-73**.
③ Contact Eaton for availability.

Notes:

- Weld-resistant for capacitors with inrush current peaks up to 180 x I_N.

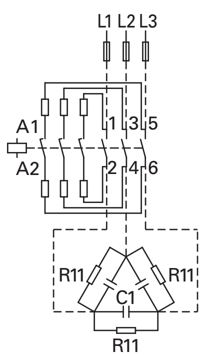


Figure 34-36. Wiring Diagram

- In the case of group compensation multi-stage capacitor banks are connected to the mains, as required. In the process, transient currents of up to 180 x I_e can flow between the capacitors. The capacitors are pre-charged via the early-make auxiliary contacts and the fitted wire resistors, thereby reducing the inrush current. The main contacts then close after a time lag and carry the uninterrupted current. The contactors for capacitors are weld-resistant with inrush current peaks up to 180 x 1 I_e due to their special contacts. For switching reactive-power compensation equipment with chokes, observe design notes.

- For switching of power factor connection with reactors please observe engineering notes, **Table 34-74**. Use of the contactors XTCE without series resistor for centralized power factor correction — when using contactors for group compensation, a minimum inductance of approximately 6 µH per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately 140 mm diameter. The conductor cross-section must be selected according to the rated current per phase.

Table 34-73. Magnet Coil Suffix

Coil Voltage	Suffix Code
110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz, 240V 60 Hz	**F**
190V 50 Hz, 220V 60 Hz	**G**
400V 50 Hz, 440V 60 Hz	**N**

Table 34-74. Engineering Notes for XTCC and XTCE Contactors for Power Factor Correction

Catalog Number	Switching Duty in kVar			
	230V	400V 420V 440V	525V	690V
Individual Compensation, Open Version				
XTCE007B	1.5	3	3.5	5
XTCE009B	2	4	4.5	6
XTCE012B	2.5	4.5	5.5	7
XTCE015B	2.5	4.5	5.5	7
XTCE018C	6.5	12	14.5	19
XTCE025C	7	13.5	16	21
XTCE032C	7.5	14.5	17	22.5
XTCE040D	11	20.5	24.5	32
XTCE050D	11.5	22	26	34.5
XTCE065D	12.5	23.5	28	37
XTCE080F	16	30.5	36.5	48
XTCE095F	18	34	41	54
XTCE115G	24	46	54.5	72
XTCE150G	28	53	63.5	83.5
XTCE185L	87	150	190	150
XTCE300M	115	200	265	200
XTCE580N	175	300	400	300
Group Compensation, with Reactor, Open Version				
XTCE007B	4	7	7.5	12
XTCE009B	5	8	10	14
XTCE012B	5.5	10	12	16
XTCE015B	5.5	10	12	16
XTCE018C	7.5	16	20	28
XTCE025C	9	18	23	30
XTCE032C	10	20	24	32
XTCE040D	13	25	30	40
XTCE050D	16	30	36	48
XTCE065D	19	36	43	57
XTCE080F	30	58	68	90
XTCE095F	34	66	79	104
XTCE115G	44	80	100	125
XTCE150G	50	97	115	152
XTCE185L	80	150	200	260
XTCE225L	100	175	230	300
XTCE250L	110	190	260	340
XTCE300M	130	225	290	390
XTCE400M	160	280	370	480
XTCE500M	220	390	500	680
Group Compensation, without Reactor, Open Version				
XTCC012B	7.5	12.5	16.7	20
XTCC020C	11	20	25	33.3
XTCC025C	15	25	33.3	40
XTCC033D	20	33.3	40	55
XTCC050D	25	50	65	85
XTCR185L	66	115	145	115
XTCE300M	85	150	195	150
XTCE580N	145	250	333	250

Discount Symbol **1CD7**

Accessories

Auxiliary Contacts

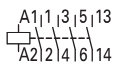
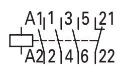
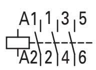
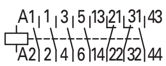
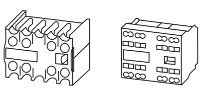
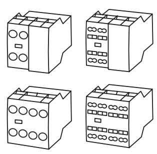
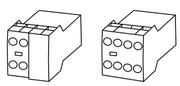
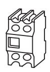
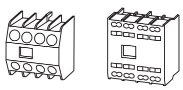
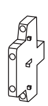
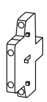
Front mounted snap-on auxiliary contacts for *XT* contactors are available with screw or spring cage terminals in a variety of contact configurations.

Notes:
The 7 – 32A XTCE Contactors have positively driven contacts between the integrated auxiliary contact and the auxiliary contact module as well as within the auxiliary contact modules.

The 40 – 65A XTCE Contactors have positively driven contacts within the auxiliary contact module. 6 auxiliary contacts are possible with a combination of side mounted and front mount auxiliary contacts.

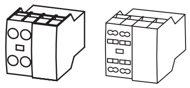
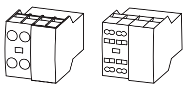
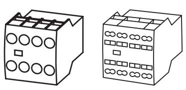
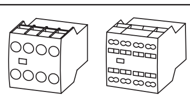
Frame B – C contactors with 1NC built-in auxiliary are mirror contacts (XTCE...B01_ – XTCE...C01_).

Table 34-75. XTCE and XTCS Auxiliary Contact Overview

Frame	A	B	C	D	F	G	L – R
Catalog Numbers	XTMC6A... – XTMC9A...	XTCE007B... – XTCE015B...	XTCE018C... – XTCE032C...	XTCE040D00_ – XTCE065D00_	XTCE080F00_ – XTCE095F00_	XTCE115G00_ – XTCE150G00_	XTCE185L22_ – XTCEC20R22_ ①
Contactor Width	45 mm	45 mm	45 mm	55 mm	90 mm	90 mm	Various
Built-In Auxiliary	1NO or 1NC	1NO or 1NC	1NO or 1NC	—	—	—	2NO-2NC
Contact Sequence							
Front (Top) Mount Auxiliary	**2-Pole & 4-Pole (Screw or Spring Cage):** 	**Standard 2-Pole & 4-Pole Versions (Screw or Spring Cage):**  **Tall Version (Screw Only):** 		**2-Pole (Screw Only):**  **4-Pole (Screw or Spring Cage):** 			N/A
Side Mount Auxiliary	N/A	N/A	**2-Pole (Screw Only):** 	**2-Pole (Screw or Spring Cage):** 			

① Frame L – R auxiliary contacts also apply to XTCS185L... – XTCS500M... contactors.

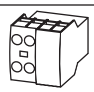
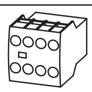
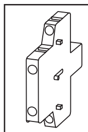
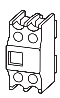
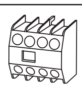
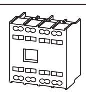
Table 34-76. Auxiliary Contacts

	Conventional Thermal Current, Open at 60°C $I_{th} = I_e$, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price U.S. $ ①
Frame B – C — Front (Top) Mount								
	16	2	2NO	53 63 54 64	5	**XTCEXFAC20**	**XTCEXFACC20**	
	16	2	1NO-1NC	53 61 54 62	5	**XTCEXFAC11**	**XTCEXFACC11**	
	16	2	2NC	51 61 52 62	5	**XTCEXFAC02**	**XTCEXFACC02**	
	16	2	$1NO_E$-$1NC_L$	57 65 58 66	5	**XTCEXFALC11** ②	**XTCEXFALCC11** ②	
	16	2	1NO-1NC	21 33 22 34 21 31	5	**XTCEXFDC11** ③	**XTCEXFDCC11** ③	
	16	2	2NC	21 31 22 32	5	**XTCEXFCC02** ③	**XTCEXFCCC02** ③	
	16	4	4NO	53 63 73 83 54 64 74 84	5	**XTCEXFAC40**	**XTCEXFACC40**	
	16	4	3NO-1NC	53 61 73 83 54 62 74 84	5	**XTCEXFAC31**	**XTCEXFACC31**	
	16	4	2NO-2NC	53 61 71 83 54 62 72 84	5	**XTCEXFAC22**	**XTCEXFACC22**	
	16	4	1NO-3NC	53 61 71 81 54 62 72 82	5	**XTCEXFAC13**	**XTCEXFACC13**	
	16	4	4NC	51 61 71 81 52 62 72 82	5	**XTCEXFAC04**	**XTCEXFACC04**	
	16	4	$1NO_E$-$1NC_L$	57 65 71 83 58 66 72 84	5	**XTCEXFCLC22** ②	**XTCEXFCLCC22** ②	
	16	4	2NO-2NC	21 31 43 53 22 32 44 54	5	**XTCEXFCC22** ③	**XTCEXFCCC22** ③	

① Orders must be placed in multiples of package quantity listed.
② 1 early-make contact ($1NO_E$), 1 late-break contact ($1NC_L$).
③ To avoid duplicate terminal numbers in contact sequence, these auxiliary contacts should only be used with contactors having a built-in 1NO contact (XTCE...B10_, XTCE...C10_).

Technical Data .... **Page 34-75**
Discount Symbol **1CD7**

Table 34-76. Auxiliary Contacts (Continued)

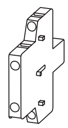
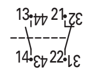
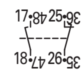
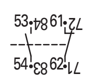
	Conventional Thermal Current, Open at 60°C Ith = Ie, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price U.S. $ ①
Frame B – C — Front (Top) Mount — Tall Version ③								
	16	2	2NO	53 63 54 64	5	**XTCEXFATC20**	—	
	16	2	1NO-1NC	53 61 54 62	5	**XTCEXFATC11**	—	
	16	2	2NC	51 61 52 62	5	**XTCEXFATC02**	—	
	16	4	2NO-2NC	53 61 71 83 54 62 72 84	5	**XTCEXFATC22**	—	
Frame C — Side Mount								
	10	2	1NO-1NC	53 61 54 62	1	**XTCEXSCC11** ④	—	
Frame D – G								
	16	2	2NO	13 23 14 24	5	**XTCEXFBG20**	—	
	16	2	1NO-1NC	53 61 54 62	5	**XTCEXFAG11**	—	
	16	2	1NO-1NC	13 21 14 22	5	**XTCEXFBG11**	—	
	16	2	2NC	11 21 12 22	5	**XTCEXFBG02**	—	
 	16	4	4NO-0NC	13 23 33 43 14 24 34 44	5	**XTCEXFBG40**	**XTCEXFBGC40**	
	16	4	3NO-1NC	13 21 33 43 14 22 34 44	5	**XTCEXFBG31**	**XTCEXFBGC31**	
	16	4	2NO-2NC	13 21 31 43 14 22 32 44	5	**XTCEXFBG22**	**XTCEXFBGC22**	
	16	4	2NO-2NC	53 61 71 83 54 62 72 84	5	**XTCEXFAG22**	**XTCEXFAGC22**	
	16	4	1NO-3NC	13 21 31 41 14 22 32 42	5	**XTCEXFBG13**	**XTCEXFBGC13**	
	16	4	0NO-4NC	11 21 31 41 12 22 32 42	5	**XTCEXFBG04**	**XTCEXFBGC04**	
	16	4	1NO$_E$-1NC$_L$	13 21 35 47 14 22 36 48	5	**XTCEXFBLG22** ②	**XTCEXFBLGC22** ②	

① Orders must be placed in multiples of package quantity listed.
② 1 early-make contact (1NO$_E$), 1 late-break contact (1NC$_L$).
③ Front (Top) Mount Tall Version is for use with Frame B Electrical Wire Bridges and Link Kits (see **Pages 34-56, 34-57**) and Toolless Plug Combination Connection Kits: XTCEXRLB, XTCEXSDLB, XTPAXTPCB, XTPAXTPCRB, XTPAX.
④ Can be mounted to the left side of contactor only. Cannot be used in combination with front (top) mount auxiliary contacts or mechanical interlocks.

Notes:
- Interlocked opposing contacts, to IEC/EN 60947-5-1 Annex L (positively driven), within the auxiliary contact modules (not NO (early make) and NC (late break) contacts) and for the built-in auxiliary contacts of the XTCE007B... – XTCE032C....
- Auxiliary break contact can be used as mirror contact to IEC/EN 60947-4-1 Annex F (not NC (late break) contact).
- No auxiliary contacts can be fitted between two contactors.

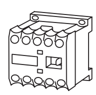
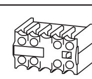
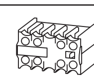
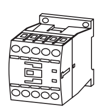
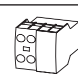
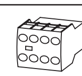
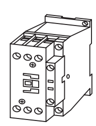
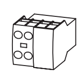
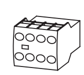
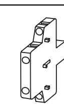
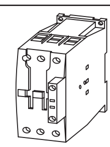
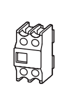
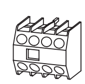
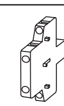
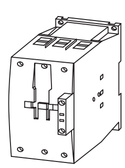
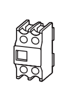
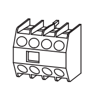
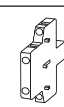
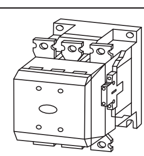
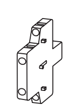
Technical Data .... **Page 34-75**
Discount Symbol **1CD7**

Table 34-77. Side Mount Auxiliary Contacts for Frame D – R, 40 – 2000A

	Conventional Free Air Thermal Current, Ith = Ie, AC-1 in Amps	Poles	Contact Configuration	Circuit Symbol	Pkg. Qty.	Screw Terminals Catalog Number	Spring Cage Terminals Catalog Number	Price U.S. $
Frame D – R								
	10	2	1NO-1NC		1	**XTCEXSBN11**	**XTCEXSBNC11**	
	10	2	$1NO_E-1NC_L$		1	**XTCEXSBLN11** ①	**—**	
	10	2	1NO-1NC		1	**XTCEXSCN11** ②	**XTCEXSCNC11** ②	

① 1 early-make contact ($1NO_E$), 1 late-break contact ($1NC_L$).
② To maintain proper terminal marking, XTCEXSCN_ should not be used with Frame D contactors and only used with Frame F – G contactors in combination with XTCEXSBN_.

Table 34-78. Auxiliary Contacts Possible Combinations

Frame Size	Catalog Number	Contactor	Built-In Auxiliary	Front (Top) Mount 2-Pole	Front (Top) Mount 4-Pole	Side Mount 2-Pole	Total Auxiliary Contacts Available
A	**XTMC6A… – XTMC9A…**		1NO or 1NC	1	—	—	3
				—	1	—	5
						—	—
B	**XTCE007B… – XTCE015B…**		1NO or 1NC	1	—	—	3
				—	1	—	5
						—	—
C	**XTCE018C… – XTCE032C…**		1NO or 1NC	1	—	—	3
				—	1	—	5
				—	—	1	3
							—
D	**XTCE040D00_ – XTCE065D00_**		—	1	—	2	6
				—	1	1	6
							—
F – G	**XTCE080F00_ – XTCE150G00_**		—	1	—	2	6
				—	1	2	8
				—	—	4	8
							—
L – R	**XTCE185L22_ – XTCEC20R22_**		2NO-2NC	—	—	2	8
				—	—		—

Notes:
■ Forced operation contact to IEC/EN 60947-5-1 Appendix L (positively driven), inside the auxiliary contact unit (not early close and late opening).
■ Auxiliary normally closed contact can be used as mirror contact to IEC/EN 60947-4-1 Appendix F (not late opening).
■ No auxiliary contacts can be fitted between two contactors.

Technical Data .... **Page 34-75**
Discount Symbol **1CD7**

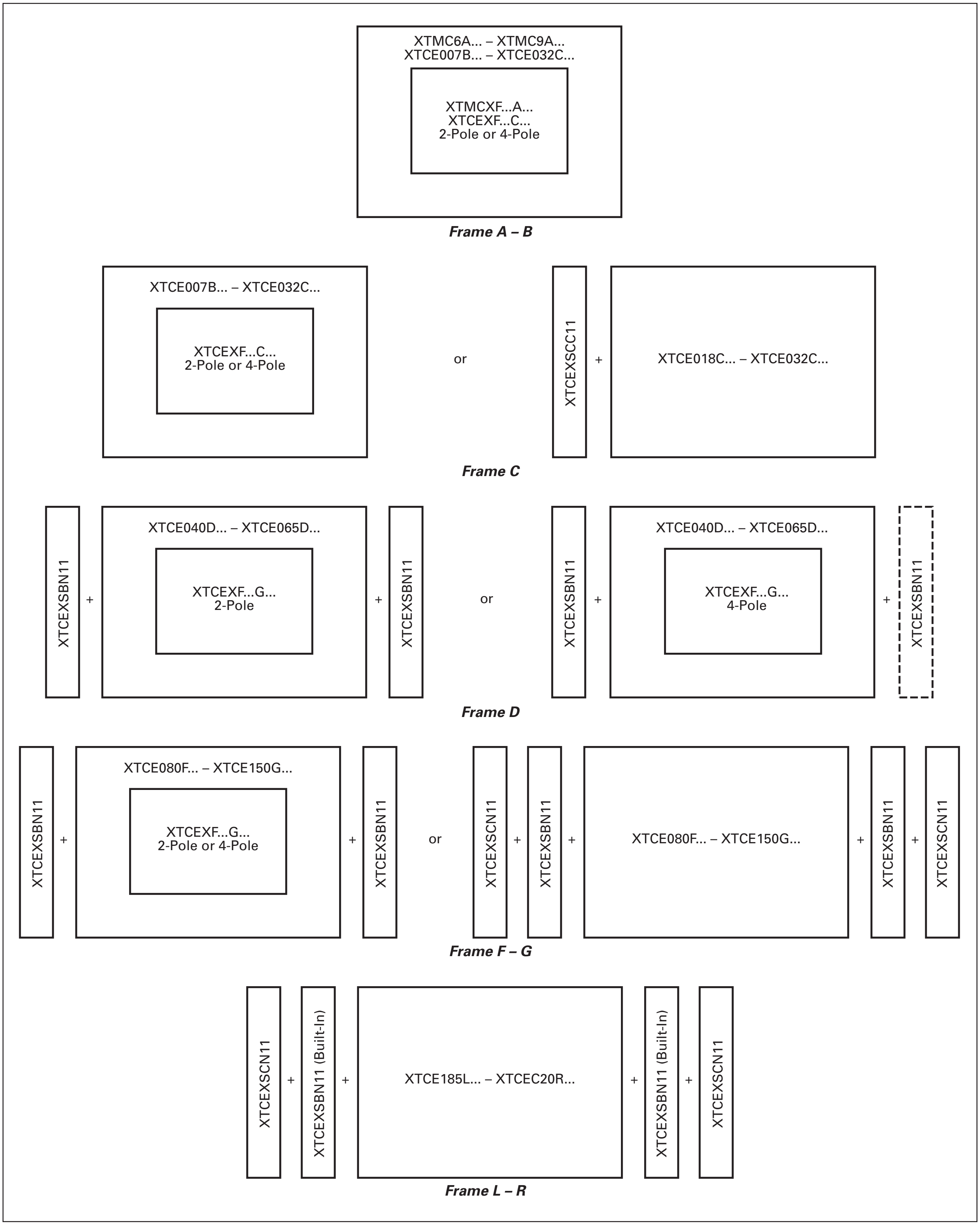


Figure 34-37. Auxiliary Contact Combinations

34

Suppressors

The switching of contactor coils can generate voltage transients that may cause arching on switch contacts and/or damage electronics on the control line. Either a RC or Varistor Suppressor is recommended in these types of applications. All ***XT*** DC contactor coils have built-in suppression.

Varistor Suppressors clamp the voltage transient above the maximum coil voltage and are recommended when the level of the transient is known to not exceed the coil voltage. RC Suppressors slow and reduce the level of the voltage transient but do not clamp them at a specific level. The slowing of the transient can reduce electrical interference. These are recommended in applications where operating rates are high.

RC Suppressor ①②

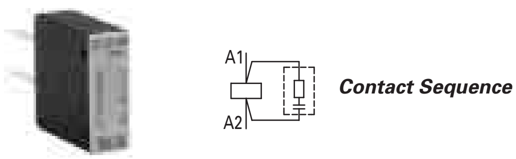


Table 34-79. RC Suppressor

Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ③
24 – 48 48 – 130 110 – 240 240 – 500	XTCE007B – XTCE015B, XTCF020B	10 10 10 10	**XTCEXRSBW** **XTCEXRSBA** **XTCEXRSBB** **XTCEXRSBC**	
24 – 48 110 – 130 130 – 240 240 – 500	XTCE018C – XTCE032C	10 10 10 10	**XTCEXRSCW** **XTCEXRSCA** **XTCEXRSCB** **XTCEXRSCC**	
24 – 48 110 – 130 130 – 240 240 – 500	XTCE040D – XTCE095F	10 10 10 10	**XTCEXRSFW** **XTCEXRSFA** **XTCEXRSFB** **XTCEXRSFC**	

① Note drop-out delay.
② For AC operated contactors, 50 – 60 Hz. DC operated contactors and XTCE165G_ and XTCE150G_ have a built-in suppressor circuit.
③ Orders must be placed in multiples of package quantity listed.

Varistor Suppressor ④⑤

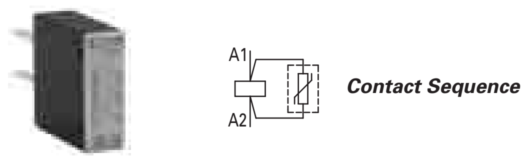


Table 34-80. Varistor Suppressor

Voltage	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑥
24 – 48 48 – 130 130 – 240 240 – 500	XTCE007B – XTCE015B, XTCF020B	10 10 10 10	**XTCEXVSBW** **XTCEXVSBA** **XTCEXVSBB** **XTCEXVSBC**	
24 – 48 48 – 130 130 – 240 240 – 500	XTCE018C – XTCE032C	10 10 10 10	**XTCEXVSCW** **XTCEXVSCA** **XTCEXVSCB** **XTCEXVSCC**	
24 – 48 48 – 130 130 – 240 240 – 500	XTCE040D – XTCE095F	10 10 10 10	**XTCEXVSFW** **XTCEXVSFA** **XTCEXVSFB** **XTCEXVSFC**	

④ Note drop-out delay.
⑤ For AC operated contactors, 50/60 Hz. DC operated contactors have a built-in suppressor.
⑥ Orders must be placed in multiples of package quantity listed.

Varistor Suppressor with Integrated LED ⑦⑧

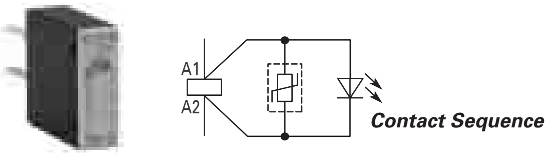


Table 34-81. Varistor Suppressor

Voltage AC	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑨
24 – 48 130 – 240	XTCE007B – XTCE015B	10 10	**XTCEXVSLBW** **XTCEXVSLBB**	
24 – 48 130 – 240	XTCE018C – XTCE032C	10 10	**XTCEXVSLCW** **XTCEXVSLCB**	
24 – 48 130 – 240	XTCE040D – XTCE095F	10 10	**XTCEXVSLFW** **XTCEXVSLFB**	

⑦ Note drop-out delay.
⑧ For AC operated contactors, 50/60 Hz. DC operated contactors have an integrated suppressor.
⑨ Orders must be placed in multiples of package quantity listed.

Free-Wheel Diode Suppressor ⑩

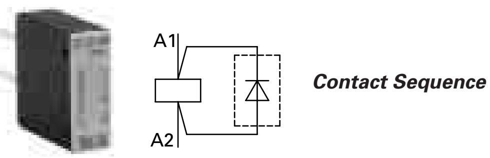


Table 34-82. Free-Wheel Diode Suppressor

Voltage DC	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑪
12 – 250	XTCE007B – XTCE015B, XTCF020B	10	**XTCEXDSB**	

⑩ In addition to the built-in suppressor circuit for DC actuated contactors. Prevents negative breaking voltage when contactors are used in combination with a safety PLC.
⑪ Orders must be placed in multiples of package quantity listed.

Voltage Indicator

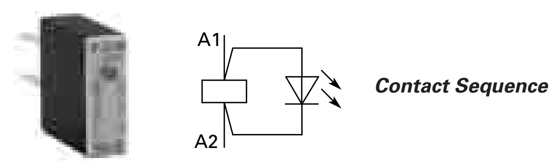


Table 34-83. Voltage Indicator

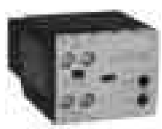
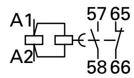
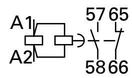
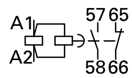
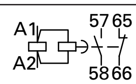
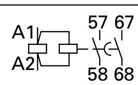
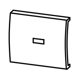
Voltage DC	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑫
12 – 48 48 – 130 110 – 250	XTCE007B – XTCE015B, XTCF020B	10 10 10	**XTCEXVIBW** **XTCEXVIBA** **XTCEXVIBB**	
24 – 48 48 – 130 130 – 250	XTCE018C – XTCE032C	10 10 10	**XTCEXVICW** **XTCEXVICA** **XTCEXVICB**	
42 – 48 48 – 130 130 – 250	DC operated: XTCE040D – XTCE095F AC/DC operated: XTCE115G – XTCE150G	10 10 10	**XTCEXVIGW** **XTCEXVIGA** **XTCEXVIGB**	

⑫ Orders must be placed in multiples of package quantity listed.

Technical Data .... **Page 34-75**
Discount Symbol **1CD7**

Electronic Timer Modules ①

Table 34-84. Electronic Timer Modules for Frame B – C Contactors (7 – 32A)

	Voltage	Contact Sequence	Timing Range	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	**On-Delayed**						
	24V AC/DC		0.05 s – 1 s 0.5 – 10 s 5 s – 100 s	XTCE...B... XTCE...C...	1	**XTCEXTEEC11T**	
	100 – 130V AC					**XTCEXTEEC11A**	
	200 – 240V AC					**XTCEXTEEC11B**	
	Off-Delayed						
	24V AC/DC		0.05 s – 1 s	XTCE...B... XTCE...C...	1	**XTCEXTED1C11T**	
	100 – 130V AC					**XTCEXTED1C11A**	
	200 – 230V AC					**XTCEXTED1C11B**	
	24V AC/DC		0.5 – 10 s	XTCE...B... XTCE...C...	1	**XTCEXTED10C11T**	
	100 – 130V AC					**XTCEXTED10C11A**	
	200 – 240V AC					**XTCEXTED10C11B**	
	24V AC/DC		5 s – 100 s	XTCE...B... XTCE...C...	1	**XTCEXTED100C11T**	
	100 – 130V AC					**XTCEXTED100C11A**	
	200 – 240V AC					**XTCEXTED100C11B**	
	Star-Delta						
	24V AC/DC		1 s – 30 s	XTCE...B... XTCE...C...	1	**XTCEXTEYC20T**	
	100 – 130V AC					**XTCEXTEYC20A**	
	200 – 240V AC					**XTCEXTEYC20B**	
Sealable Shroud							
	—	Transparent sealable shroud used to protect electronic timer modules from unwanted access.		XTCEXTEE, XTCEXTED, XTCEXTEY	1	**XTCEXTESHRD**	

① Front (Top) mounted timer modules for use with XTCE...B and XTCE…C contactors. Cannot be combined with top mount auxiliary contacts, XTCEXF...C__.

Table 34-85. XTCR Reversing Contactor Components

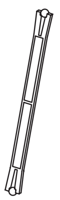
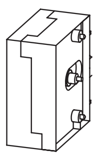
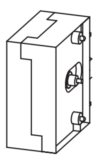
Qty	Frame	B	C	D	F	G
2	Contactor	XTCE...B01_	XTCE...B01_	XTCE...D00_	XTCE...F00_	XTCE...G00_
2	Auxiliary Contact	XTCEXFAC20	XTCEXFAC20	XTCEXFBG11	XTCEXFBG11	XTCEXFBG11
1	Mechanical Interlock	XTCEXMLB	XTCEXMLC	XTCEXMLD	XTCEXMLG	XTCEXMLG
1	Reversing Link Kit	XTCEXRLB	XTCEXRLC	XTCEXRLD	XTCEXRLG	XTCEXRLG

Discount Symbol **1CD7**

Mechanical Interlock ①



Table 34-86. Mechanical Interlock

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ②
	XTCE007B – XTCE015B, XTCF020B	5	**XTCEXMLB**	
	XTCE018C – XTCE032C	1	**XTCEXMLC**	
	XTCE040D – XTCE065D	1	**XTCEXMLD**	
	XTAE080F – XTCE150G	1	**XTCEXMLG** ③	
	XTCE185L – XTCE500M	1	**XTCEXMLM**	
	XTCE580N – XTCEC10N	1	**XTCEXMLN** ③	

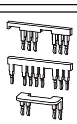
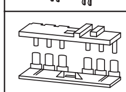
① For two contactors with AC or DC operated magnet system which are horizontally or vertically mounted. For B – G frames, mechanical lifespan is 2.5 x 10^6 operations and the distance between contactors is 0 mm. For L – N frames, mechanical lifespan is 5 x 10^6 operations and no auxiliary contact can be mounted between the mechanical interlock and the contactor — the distance between contactors is 15 mm.
② Orders must be placed in multiples of package quantity listed.
③ XTCEXMLG and XTCEXMLN consist of an interlock element and mounting plate.

Reversing Link Kits



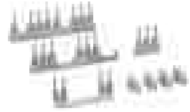
Main current wiring for reversing combinations. Includes Paralleling Bridge and Reversing Bridge. Does not include Mechanical Interlock, see **Table 34-86**.

Table 34-87. Reversing Link Kits

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	XTCE007B – XTCE015B	1	**XTCEXRLB** ④	
	XTCE018C – XTCE032C	1	**XTCEXRLC**	
	XTCE040D – XTCE065D	1	**XTCEXRLD**	
	XTCE115G – XTCE150G	1	**XTCEXRLG**	
	XTCE185L – XTCE250L	1	**XTCEXRLL**	
	XTCE300M – XTCE400M	1	**XTCEXRLM400**	

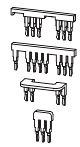
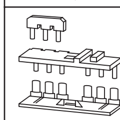
④ Also includes Interlocking Bridge (XTCEXLBB). The following control cables are integrated for electrical interlock: K1M: A1 – K2M: 21; K1M: 21 – K2M: A1; K1M: A2 – K2M: A2.

Star-Delta (Wye-Delta) Link Kits



Main current wiring for star-delta (wye-delta) combinations. Includes Paralleling Bridge, Reversing Bridge, and Star-Delta Bridge. Does not include Mechanical Interlock, see **Table 34-86**.

Table 34-88. Star-Delta (Wye-Delta) Link Kits

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	XTCE007B – XTCE015B	1	**XTCEXSDLB** ⑤	
	XTCE018C – XTCE032C	1	**XTCEXSDLC**	
	XTCE040D – XTCE065D	1	**XTCEXSDLD**	
	XTCE080F – XTCE095F	1	**XTCEXSDLF**	
	XTCE115G – XTCE150G	1	**XTCEXSDLG**	
	XTCE185L – XTCE225L	1	**XTCEXSDLL225**	
	XTCE250L	1	**XTCEXSDLL250**	
	XTCE300M – XTCE400M	1	**XTCEXSDLM400**	

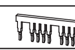
⑤ Also includes Interlocking Bridge (XTCEXLBB). The following control cables are integrated for electrical interlock: K1M: A1 – K2M: 21; K1M: 21 – K2M: A1; K1M: A2 – K2M: A2.

Paralleling Bridge



Component part of Reversing Link Kit (XTCEXRL_). Parallels the phases on the line-side of two contactors.

Table 34-89. Paralleling Bridge

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑥
	XTCE007B – XTCE015B	20	**XTCEXPBB**	
	XTCE018C – XTCE032C	20	**XTCEXPBC**	
	XTCE040D – XTCE065D	10	**XTCEXPBD**	
	XTCE080F – XTCE150G	10	**XTCEXPBG**	

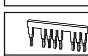
⑥ Orders must be placed in multiples of package quantity listed.

Reversing Bridge



Component part of Reversing Link Kit (XTCEXRL_). Reverses the phases on the load-side of two contactors.

Table 34-90. Reversing Bridge

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑦
	XTCE007B – XTCE015B	20	**XTCEXRBB**	
	XTCE018C – XTCE032C	20	**XTCEXRBC**	
	XTCE040D – XTCE065D	10	**XTCEXRBD**	
	XTCE080F – XTCE150G	10	**XTCEXRBG**	

⑦ Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

Electrical Interlocking Bridge

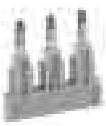
Connects NC auxiliary contact with A2 terminal of other contactor in reversing application. Included in XTCEXRLB reversing link kit.

Table 34-91. Electrical Interlocking Bridge

For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ [1]
XTCE007B – XTCE015B	20	**XTCEXLBB**	

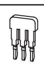
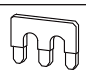
[1] Orders must be placed in multiples of package quantity listed.

Star-Delta (Wye-Delta) Bridge



Component part of Star-Delta Link Kit (XTCEXSDL_). Commons the 3-phases on the line side of shorting contactor.

Table 34-92. Star-Delta (Wye-Delta) Bridge

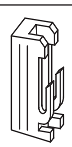
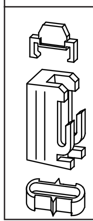
	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ [2]
	XTCE007B – XTCE015B	20	**XTCEXSDBB** [3]	
	XTCE018C – XTCE032C	20	**XTCEXSDBC**	
	XTCE040D – XTCE065D	10	**XTCEXSDBD**	
	XTCE080F – XTCE150G	1	**XTCEXSDBG**	
	XTCE185L – XTCE400M	1	**XTCEXSDB400**	
	XTCE500M	1	**XTCEXSDB500**	

[2] Orders must be placed in multiples of package quantity listed.
[3] Frame B is tool-less connection type.

Connector [4]

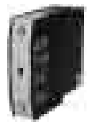


Table 34-93. Connector

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ [5]
	XTCE007B – XTCE032C	50	**XTCEXCNC**	
	XTCE040D – XTCE150G	10	**XTCEXCNG**	

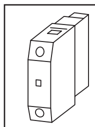
[4] For mechanically arranging contactors in combinations. Distance between contactors is 0 mm.
[5] Orders must be placed in multiples of package quantity listed.

Add-On Fourth Pole

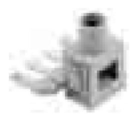


Add-On Fourth Pole for use with Frame D contactors. Only for AC-1 load. Up to two auxiliary contacts can be fitted.

Table 34-94. Fourth Pole

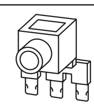
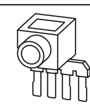
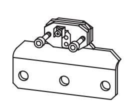
	For Use with…	AC-1 (A) Open/ Enclosed	Pkg. Qty.	Catalog Number	Price U.S. $
	XTCE040D00_	35/30A	1	**XTCEX4P35D**	
	XTCE050D00_ XTCE065D00_	75/60A	1	**XTCEX4P75D**	

Parallel Link [6][7][8]



For using one contactor per phase. Each package comes with (2) links for line: load.

Table 34-95. Parallel Link

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ [9]
	XTCE007B – XTCE015B	5	**XTCEXPLKB**	
	XTCE018C – XTCE032C	5	**XTCEXPLKC**	
	XTCE040D – XTCE065D	1	**XTCEXPLKD**	
	XTCE080F – XTCE150G	1	**XTCEXPLKG**	
	XTCE185L	1	**XTCEXPLKL185**	

[6] Fourth Pole can be broken off: 4-Pole: I_{th} = 60A; 3-Pole: I_{th} = 50A.
[7] AC-1 current carrying capacity of the contactor increases by a factor of 2.5. For XTCEXPLKL185, one shroud is included for protection against accidental contact.
[8] Protected against accidental contact in accordance with IEC 536.
[9] Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

3-Phase Commoning Link

Main current wiring that parallels and commons the line side of multiple contactors. For use with Frame B contactors only. Protected against accidental contact, short-circuit proof. Max voltage (U_e) = 690V, Max Current (I_e) = 63A.

Table 34-96. 3-Phase Commoning Link

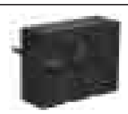
	Notes	Pkg. Qty.	Catalog Number	Price U.S. $ ①
	Suitable for 3 contactors, length = 135 mm	5	**XTCEXCLK3B**	
	Suitable for 4 contactors, length = 180 mm	5	**XTCEXCLK4B**	
	Suitable for 5 contactors, length = 225 mm	5	**XTCEXCLK5B**	

① Orders must be placed in multiples of package quantity listed.

Incoming Terminal

Terminal for use with three-phase commoning link XTCEXCLK_B.

Table 34-97. Incoming Terminal

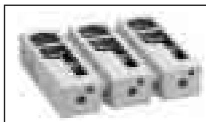
	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ②
	XTCE007B – XTCE015B	5	**XTCEXITB**	

② Orders must be placed in multiples of package quantity listed.

Terminal Lug Assembly

For connection of: round conductor, flexible and stranded, flat strip conductor. With control circuit terminal. See **Table 34-118**, **Page 34-75** for terminal capacities.

Table 34-98. Terminal Lug Assembly

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	XTCE185L – XTCE225L	1	**XTCEXTLA225**	
	XTCE250L – XTCE400M	1	**XTCEXTLA400**	

Terminal Lug Kit — Set of (3) Lugs



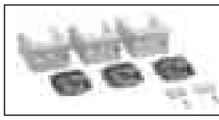
Table 34-99. Set of (3) Lugs

For Use with…	Description	Pkg. Qty.	Catalog Number	Price U.S. $
XTCE500M	Set of 3 Lugs #4-500MCM 2-Phase Cu/Al 500A	1	**XTCEXTL500**	
XTCE650N	Set of 3 Lugs #2-500MCM 2-Phase Cu/Al 650A	1	**XTCEXTL650**	
XTCE820N	Set of 3 Lugs #2-500MCM 4-Phase Cu/Al 820A	1	**XTCEXTL820**	

Terminal Flat Bar

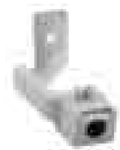
For connection of a flat strip conductor. Comes with control circuit terminal (consisting of 3 flat strip conductor terminals).

Table 34-100. Terminal Flat Bar

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	XTCE500M – XTCE650N	1	**XTCEXTFB650**	
	XTCE750N – XTCE820N	1	**XTCEXTFB820**	

Note: Not UL Listed.

Control Wire Terminal Extension



Fits to Frame F – G contactors and allows connection of control wire to power terminals.

Table 34-101. Control Wire Terminal Extension

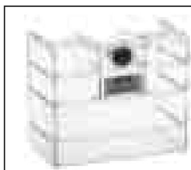
For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ③
XTCE080F – XTCE150G	10	**XTCEXTCWG**	

③ Orders must be placed in multiples of package quantity listed.

Terminal Shrouds

Protection against direct contact with connection lugs when touched vertically from the front.

Table 34-102. Terminal Shrouds

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	XTCE185L – XTCE400M	1	**XTCEXTS400**	
	XTCE500M	1	**XTCEXTS500**	
	XTCE580N – XTCE650N	1	**XTCEXTS650**	
	XTCE750N – XTCEC10N	1	**XTCEXTS820**	

Discount Symbol **1CD7**

Renewal Parts

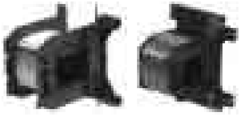


Table 34-103. Replacement Coils

Voltage	Coil Suffix	Catalog Number	Price U.S. $
Frame C			
110/50 120/60	A	XTCERENCOILCA	
110 – 130V DC	AD	XTCERENCOILCAD	
220/50 240/60	B	XTCERENCOILCB	
200 – 240V DC	BD	XTCERENCOILCBD	
415/50 480/60	C	XTCERENCOILCC	
550/50 600/60	D	XTCERENCOILCD	
208/60	E	XTCERENCOILCE	
230/50	F	XTCERENCOILCF	
190/50 220/60	G	XTCERENCOILCG	
240/50 277/60	H	XTCERENCOILCH	
380/50 440/60	L	XTCERENCOILCL	
400/50	N	XTCERENCOILCN	
380/60	P	XTCERENCOILCP	
12/50 12/60	R	XTCERENCOILCR	
12 – 14V DC	RD	XTCERENCOILCRD	
24/50 24/60	T	XTCERENCOILCT	
24 – 27V DC	TD	XTCERENCOILCTD	
24/50	U	XTCERENCOILCU	
42/50 48/60	W	XTCERENCOILCW	
48 – 60V DC	WD	XTCERENCOILCWD	
48/50	Y	XTCERENCOILCY	
Frame D			
110/50 120/60	A	XTCERENCOILDA	
110 – 130V DC	AD	XTCERENCOILDAD	
220/50 240/60	B	XTCERENCOILDB	
200 – 240V DC	BD	XTCERENCOILDBD	
415/50 480/60	C	XTCERENCOILDC	
550/50 600/60	D	XTCERENCOILDD	
208/60	E	XTCERENCOILDE	
230/50	F	XTCERENCOILDF	
190/50 220/60	G	XTCERENCOILDG	
240/50 277/60	H	XTCERENCOILDH	
380/50 440/60	L	XTCERENCOILDL	
400/50	N	XTCERENCOILDN	
380/60	P	XTCERENCOILDP	
12/50 12/60	R	XTCERENCOILDR	
12 – 14V DC	RD	XTCERENCOILDRD	
24/50 24/60	T	XTCERENCOILDT	
24 – 27V DC	TD	XTCERENCOILDTD	
24/50	U	XTCERENCOILDU	
42/50 48/60	W	XTCERENCOILDW	
48 – 60V DC	WD	XTCERENCOILDWD	
48/50	Y	XTCERENCOILDY	
Frame F ①			
110/50 120/60	A	XTCERENCOILFA	
110 – 130V DC	AD	XTCERENCOILFAD	
220/50 240/60	B	XTCERENCOILFB	
200 – 240V DC	BD	XTCERENCOILFBD	
415/50 480/60	C	XTCERENCOILFC	
550/50 600/60	D	XTCERENCOILFD	
208/60	E	XTCERENCOILFE	
230/50	F	XTCERENCOILFF	
190/50 220/60	G	XTCERENCOILFG	
240/50 277/60	H	XTCERENCOILFH	
380/50 440/60	L	XTCERENCOILFL	
400/50	N	XTCERENCOILFN	
380/60	P	XTCERENCOILFP	
12/50 12/60	R	XTCERENCOILFR	
24/50 24/60	T	XTCERENCOILFT	
24 – 27V DC	TD	XTCERENCOILFTD	
24/50	U	XTCERENCOILFU	
42/50 48/60	W	XTCERENCOILFW	
48 – 60V DC	WD	XTCERENCOILFWD	
48/50	Y	XTCERENCOILFY	
Frame G ③			
100 – 120V 50/60	A	XTCERENCOILGA	
110 – 130V DC	AD	XTCERENCOILGAD	
190 – 240V 50/60	B	XTCERENCOILGB	
200 – 240V DC	BD	XTCERENCOILGBD	
480 – 500V 50/60	C	XTCERENCOILGC	
380 – 440V 50/60	L	XTCERENCOILGL	
24/50 24/60	T	XTCERENCOILGT	
24 – 27V DC	TD	XTCERENCOILGTD	
42 – 48V 50/60	W	XTCERENCOILGW	
48 – 60V DC	WD	XTCERENCOILGWD	
Frame L ②			
110 – 250V AC/DC	A	XTCERENCOILLA	
250 – 500V 40 – 60	C	XTCERENCOILLC	
24 – 48V DC	TD	XTCERENCOILLTD	
48 – 110V AC/DC	Y	XTCERENCOILLY	
Frame M ②			
110 – 250V AC/DC	A	XTCERENCOILMA	
250 – 500V 40 – 60	C	XTCERENCOILMC	
24 – 48V DC	TD	XTCERENCOILMTD	
48 – 110V AC/DC	Y	XTCERENCOILMY	
Frame N ②			
110 – 250V AC/DC	A	XTCERENCOILNA	
250 – 500V 40 – 60	C	XTCERENCOILNC	
48 – 110V AC/DC	Y	XTCERENCOILNY	

① Frame F replacement coils can only be used with contactors having the following date codes: DC Coils, 2706 or later; AC Coils, 4706 or later.

② Electronic modules including coils.

③ Frame G replacement coils can only be used with contactors having date codes of 2706 or later.

Table 34-104. Replacement Contact Kits

For Use with…	Catalog Number	Price U.S. $
XTCE040D – XTCE065D	XTCERENCONTACTD	
XTCE185L – XTCE250L	XTCERENCONTACTL	
XTCE300M – XTCE500M	XTCERENCONTACTM	
XTCE085F – XTCE095F	XTCERENCONTACTF	
XTCE115G – XTCE150G	XTCERENCONTACTG	

Table 34-105. Replacement Vacuum Tube Assembly

For Use with…	Catalog Number	Price U.S. $
XTCE580N	XTCERENVACT580	
XTCE650N	XTCERENVACT650	
XTCE750N	XTCERENVACT750	
XTCE820N	XTCERENVACT820	

Table 34-106. Replacement Arc Chambers

For Use with…	Catalog Number	Price U.S. $
XTCE185L	XTCERENARC185	
XTCE225L	XTCERENARC225	
XTCE250L	XTCERENARC250	
XTCE300M	XTCERENARC300	
XTCE400M	XTCERENARC400	
XTCE500M	XTCERENARC500	

Discount Symbol **1CD7**

Technical Data and Specifications

Contents



Frame B XTCE Contactor

XT Contactors

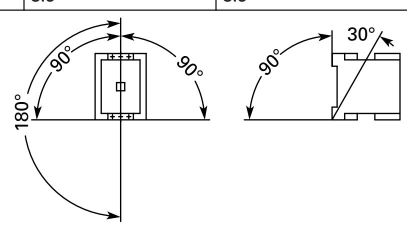
Frame B

Table 34-107. *XT* Contactors Technical Data and Specifications — Frame B

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS			
Weights in kg [Lb] AC operated DC operated	 0.23 [0.51] 0.28 [0.62]	 0.23 [0.51] 0.28 [0.62]	 0.23 [0.51] 0.28 [0.62]	 0.23 [0.51] 0.28 [0.62]
Mechanical Life	10,000,000	10,000,000	10,000,000	10,000,000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 9000 9000	 9000 9000	 9000 9000	 5000 5000
Electrical Life	See Curves, **Page 34-82**			
Electrical Operating Frequency (ops/hr) — see Curve, **Page 34-82** AC-1; 400V I_e AC-3; 400V I_e AC-4; 400V I_e	 800 1000 300	 800 1000 300	 800 1000 300	 800 1000 300
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclical, to IEC 60068-2-30			
Insulation Voltage (U_i) V AC	690	690	690	690
Impulse Withstand Voltage (U_{imp}) V AC	8000	8000	8000	8000
Operational Voltage (U_e) V AC	690	690	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (V AC) Between contacts (V AC)	 400 400	 400 400	 400 400	 400 400
Making Capacity Up to 690V (Amps) ②	112	112	144	155
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V	 70 70 50 40	 90 90 70 50	 120 120 100 70	 124 124 100 70
Short-Circuit Protection Rating Maximum Fuse Type 2 Coordination ① 400V; gG/gL 500V 690V; gG/gL 690V Type 1 Coordination ① 400V; gG/gL 500V 690V; gG/gL 690V	 20 16 35 20	 20 16 35 20	 20 20 35 20	 20 20 63 50
Degree of Protection	IP20			
Protection against Direct Contact when Actuated from Front (IEC 536)	Finger- and back-of-hand proof			

① IEC 60947 Standard.
② Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

Table 34-107. *XT* Contactors Technical Data and Specifications — Frame B (Continued)

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B
General (Continued)				
Terminal Capacity Main Cable — Screw Terminals Solid (mm2)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)
Flexible with ferrule (mm2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Terminal Capacity Control Circuit Cable — Screw Terminals Solid (mm2)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)	 1 x (0.75 – 4) 2 x (0.75 – 2.5)
Flexible with ferrule (mm2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Main Cable and Control Circuit Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6
Tools Main and Control circuit cable — Screw Terminals Pozidriv screwdriver Standard screwdriver	 Size 2 0.8 x 5.5 1 x 6	 Size 2 0.8 x 5.5 1 x 6	 Size 2 0.8 x 5.5 1 x 6	 Size 2 0.8 x 5.5 1 x 6
Terminal Capacity Main Circuit Cable — Spring Cage Terminals Solid (mm2)	 1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	 — —
Flexible (mm2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	— —
Flexible with ferrule (mm2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	— —
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	—
Terminal Capacity Control Circuit Cable — Spring Cage Terminals Solid (mm2)	 1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	 — —
Flexible (mm2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	— —
Flexible with ferrule (mm2)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	1 x (0.75 – 2.5) 1 x (0.75 – 2.5)	— —
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	—
Tools Main and Control Circuit Cable — Spring Cage Terminals Stripping Length (mm)	 10	 10	 10	 10
Screwdriver blade width (mm)	3.5	3.5	3.5	3.5
Mounting Position, AC and DC Operated				
Ambient Temperature Open Enclosed	 -25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	 -25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	 -25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	 -25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental				
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	 10g 7g 5g	 10g 7g 5g	 10g 7g 5g	 10g 7g 5g
Overvoltage Category/Pollution degree	III/3	III/3	III/3	III/3

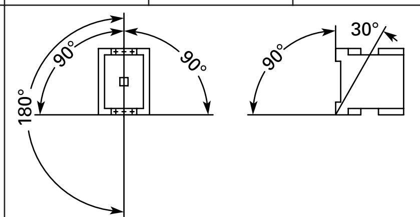
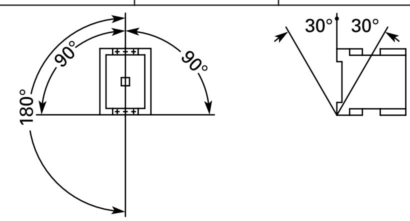
Frame C – D

Table 34-108. *XT* Contactors Technical Data and Specifications — Frame C – D

Description	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
General						
Standards	IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS					
Weights in kg [Lb] AC operated DC operated	 0.42 [0.93] 0.48 [1.06]	 0.42 [0.93] 0.48 [1.06]	 0.42 [0.93] 0.48 [1.06]	 0.9 [2.0] 1.1 [2.4]	 0.9 [2.0] 1.1 [2.4]	 0.9 [2.0] 1.1 [2.4]
Mechanical Life	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000	10,000,000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 5000 5000	 5000 5000	 5000 5000	 5000 5000	 5000 5000	 5000 5000
Electrical Mechanical Operating Frequency (ops/hr) — see Curve, **Page 34-82** AC-1; 400V I_e AC-3; 400V I_e AC-4; 400V I_e	 800 800 300	 800 800 300	 800 800 300	 800 800 300	 800 800 300	 800 800 300
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30					
Insulation Voltage (U_i) V AC	690	690	690	690	690	690
Impulse Withstand Voltage (U_{imp}) V AC	8000	8000	8000	8000	8000	8000
Operating Voltage (U_e) V AC	690	690	690	690	690	690
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (V AC) Between contacts (V AC)	 440 238	 440 440	 440 440	 440 440	 440 440	 440 440
Making Capacity (Amps)	238	350	384	560	700	910
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V	 170 170 170 120	 250 250 250 150	 320 320 320 180	 400 400 400 250	 500 500 500 320	 650 650 650 370
Short-Circuit Protection Rating Maximum Fuse (Amps) Type 2 Coordination ① 400V; gG/gL 500V 690V; gG/gL 690V Type 1 Coordination ① 400V; gG/gL 500V 690V; gG/gL 690V	 25 25 63 50	 35 35 100 50	 63 35 125 63	 63 50 125 80	 80 63 160 80	 125 80 250 100
Degree of Protection	IP00					
Protection against Direct Contact when Actuated from Front (IEC 536)	Finger- and back-of-hand proof					
Terminal Capacity Main Cable — Screw Terminals Solid (mm^2)	 1 x (0.75 – 16) 2 x (0.75 – 10)	 1 x (0.75 – 16) 2 x (0.75 – 10)	 1 x (0.75 – 16) 2 x (0.75 – 10)	 1 x (0.75 – 16) 2 x (0.75 – 10)	 1 x (0.75 – 16) 2 x (0.75 – 10)	 1 x (0.75 – 16) 2 x (0.75 – 10)
Flexible with ferrule (mm^2)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (0.75 – 16) 2 x (0.75 – 10)	1 x (2.5 – 35) 2 x (2.5 – 25)	1 x (2.5 – 35) 2 x (2.5 – 25)	1 x (2.5 – 35) 2 x (2.5 – 25)
Stranded (mm^2)	1 x 16	1 x 16	1 x 16	1 x (16 – 50) 2 x (16 – 35)	1 x (16 – 50) 2 x (16 – 35)	1 x (16 – 50) 2 x (16 – 35)
Solid or Stranded (AWG)	18 – 6	18 – 6	18 – 6	12 – 2	12 – 2	12 – 2
Flat Conductor (Number of Segments x Width x Thickness) (mm)	—	—	—	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)	2 x (6 x 9 x 0.8)
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M5 3 26.6	M5 3 26.6	M5 3 26.6	M6 3.3 29.2	M6 3.3 29.2	M6 3.3 29.2
Terminal Capacity Control Circuit Cable — Screw Terminals Solid (mm^2)	 1 x (0.75 – 4) 2 x (0.75 – 4)	 1 x (0.75 – 4) 2 x (0.75 – 4)	 1 x (0.75 – 4) 2 x (0.75 – 4)	 1 x (0.75 – 4) 2 x (0.75 – 4)	 1 x (0.75 – 4) 2 x (0.75 – 4)	 1 x (0.75 – 4) 2 x (0.75 – 4)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14
Control Circuit Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6

① IEC 60947 Standard.

Table 34-108. *XT* Contactors Technical Data and Specifications — Frame C – D (Continued)

Description	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
General (Continued)						
Tools Main and Control Circuit Cable — Screw Terminals Pozidriv screwdriver Standard screwdriver	Size 2 0.8 x 5.5 1 x 6	Size 2 0.8 x 5.5 1 x 6	Size 2 0.8 x 5.5 1 x 6	Size 2 0.8 x 5.5 1 x 6	Size 2 0.8 x 5.5 1 x 6	Size 2 0.8 x 5.5 1 x 6
Terminal Capacity Control Circuit Cable — Spring Cage Terminals Solid (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14	18 – 14
Tools Main and Control Circuit Cable — Spring Cage Terminals Stripping Length (mm)	10	10	10	10	10	10
Screwdriver blade width (mm)	3.5	3.5	3.5	3.5	3.5	3.5
Mounting Position, AC and DC operated						
Ambient Temperature Open Enclosed	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental						
Mechanical Shock Resistance (IEC/EN 60068-2-27) Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	10 7 5	10 7 5	10 7 5	10 7 5	10 7 5	10 7 5
Overvoltage Category / Pollution Degree	III/3	III/3	III/3	III/3	III/3	III/3

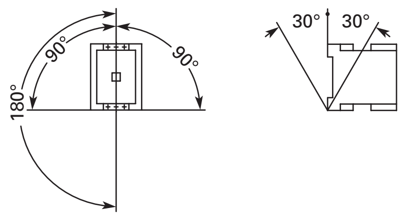
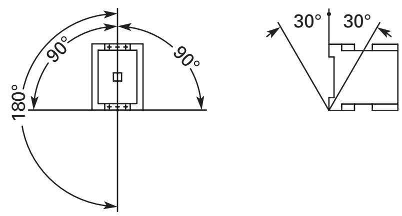
Frame F – G

Table 34-109. *XT* Contactors Technical Data and Specifications — Frame F – G

Description	XTCE080F	XTCE095F	XTCE115G	XTCE150G
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA, CCC, RoHS			
Weights in kg [Lb] AC operated DC operated	 2 [4.41] 2.1 [4.63]	 2 [4.41] 2.1 [4.63]	 2 [4.41] 2.1 [4.63]	 2 [4.41] 2.1 [4.63]
Mechanical Life	10,000,000	10,000,000	10,000,000	10,000,000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 3600 3600	 3600 3600	 3600 3600	 3600 3600
Electrical Mechanical Operating Frequency (ops/hr) — see Curve, **Page 34-82** AC-1; 400V I_e AC-3; 400V I_e AC-4; 400V I_e	 800 800 300	 800 800 300	 800 800 300	 800 800 300
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30			
Insulation Voltage (U_i) V AC	1000	1000	1000	1000
Impulse Withstand Voltage (U_{imp}) V AC	8000	8000	8000	8000
Operational Voltage (U_e) V AC	1000	1000	1000	1000
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (V AC) Between contacts (V AC)	 690 690	 690 690	 690 690	 690 690
Making Capacity (Amps)	1120	1330	1610	2100
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V 1000V	 800 800 800 650 —	 950 950 950 800 —	 1150 1150 1150 1100 —	 1500 1500 1500 1200 —
Short-Circuit Protection Rating Maximum Fuse Type 2 Coordination ② 400V; gG/gL 500V 690V; gG/gL 690V Type 1 Coordination ② 400V; gG/gL 500V 690V; gG/gL 690V	 160 160 250 200	 160 160 250 200	 250 ① 250 ①	 250 ① 250 ①
Degree of Protection	IP00			
Protection Against Direct Contact when Actuated from Front (IEC 536)	Finger- and back-of-hand proof			
Terminal Capacity Main Cable — Screw Terminals Solid (mm^2)	—	—	—	—
Flexible with ferrule (mm^2)	1 x (10 – 95) 2 x (10 – 70)	1 x (10 – 95) 2 x (10 – 70)	1 x (10 – 95) 2 x (10 – 70)	1 x (10 – 95) 2 x (10 – 70)
Stranded (mm^2)	1 x (16 – 120) 2 x (16 – 95)	1 x (16 – 120) 2 x (16 – 95)	1 x (16 – 120) 2 x (16 – 95)	1 x (16 – 120) 2 x (16 – 95)
Flat Conductor (Number of Segments x Width x Thickness) (mm)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)	2 x (6 x 16 x 0.8)
Solid or Stranded (AWG)	8 – 250 MCM	8 – 250 MCM	8 – 250 MCM	8 – 250 MCM
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M10 14 123.9	M10 14 123.9	M10 14 123.9	M10 14 123.9
Terminal Capacity Control Circuit Cable — Screw Terminals Solid (mm^2)	 1 x (0.75 – 4) 1 x (0.75 – 4)	 1 x (0.75 – 4) 1 x (0.75 – 4)	 1 x (0.75 – 4) 1 x (0.75 – 4)	 1 x (0.75 – 4) 1 x (0.75 – 4)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Control Circuit Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6

① Contact Eaton.
② IEC 60947 Standard.

Table 34-109. *XT* Contactors Technical Data and Specifications — Frame F – G (Continued)

Description	XTCE080F	XTCE095F	XTCE115G	XTCE150G
General (Continued)				
Tools Main Circuit Cable — Screw Terminals Hexagon Socket-Head Spanner (mm) Control Circuit Cable — Screw Terminals Pozidriv screwdriver Standard screwdriver	5 Size 2 0.8 x 5.5 1 x 6	5 Size 2 0.8 x 5.5 1 x 6	5 Size 2 0.8 x 5.5 1 x 6	5 Size 2 0.8 x 5.5 1 x 6
Terminal Capacity Control Circuit Cable — Spring Cage Terminals Solid (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	18 – 14	18 – 14	18 – 14	18 – 14
Tools Control Circuit Cable — Spring Cage Terminals Stripping Length (mm)	10	10	10	10
Screwdriver blade width (mm)	3.5	3.5	3.5	3.5
Mounting Position, AC and DC operated				
Ambient Temperature Open Enclosed	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F)	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F)	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F)	-25 to 60°C [-13 to 140°F] -25 to 40°C [-13 to 104°F)
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental				
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	10g 7g 5g	10g 7g 5g	10g 7g 5g	10g 7g 5g
Overvoltage Category/Pollution Degree	III/3	III/3	III/3	III/3

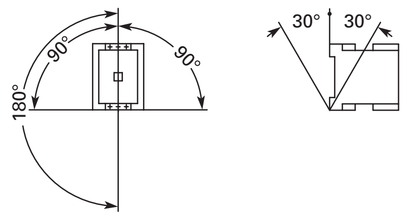
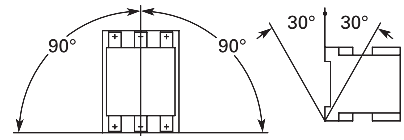
Frame L – M

Table 34-110. *XT* Contactors Technical Data and Specifications — Frame L – M

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
General						
Standards	IEC/EN 60947, VDE 0660, UL, CSA					
Weights in kg [Lb]	6.5 [14.3]	6.5 [14.3]	6.5 [14.3]	8 [18]	8 [18]	8 [18]
Mechanical Life	10,000,000	10,000,000	10,000,000	7000000	7000000	7000000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 3000 3000	 3000 3000	 3000 3000	 2000 2000	 2000 2000	 2000 2000
Mechanical Operating Frequency (ops/hr)	See **Figure 34-43** on **Page 34-83**.					
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30					
Insulation Voltage (U_i) V AC	1000	1000	1000	1000	1000	1000
Impulse Withstand Voltage (U_{imp}) V AC	8000	8000	8000	8000	8000	8000
Operating Voltage (U_e) V AC	1000	1000	1000	1000	1000	1000
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (V AC) Between contacts (V AC)	 500 500	 500 500	 500 500	 500 500	 500 500	 500 500
Making Capacity (Amps)	3000	3000	3000	5500	5500	5500
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V 1000V	 2500 2500 2500 2500 760	 2500 2500 2500 2500 760	 2500 2500 2500 2500 760	 5000 5000 5000 5000 950	 5000 5000 5000 5000 950	 5000 5000 5000 5000 950
Short-Circuit Protection Rating Maximum Fuse Type 2 Coordination ② 400V; gG/gL 500V 690V; gG/gL 690V 1000V; gG/gL 1000V Type 1 Coordination ② 400V; gG/gL 500V 690V; gG/gL 690V 1000V; gG/gL 1000V	 315 315 160 400 400 200	 315 315 160 400 400 200	 315 315 160 400 400 200	 500 500 200 630 630 250	 500 500 200 630 630 250	 500 500 200 630 630 250
Degree of Protection	IP00					
Protection Against Direct Contact when Actuated from Front (Iec 536)	Finger- and back-of-hand proof with terminal shroud or terminal block.					
Main Cable Cross-Section Flexible with cable lug (mm^2) Stranded with cable lug (mm^2) Solid or Stranded (AWG) Flat Conductor (mm) Busbar — Width in mm	 35 – 95 50 – 120 20	 50 – 240 70 – 240 1/0 – 250 MCM ① 20	 50 – 240 70 – 240 1/0 – 250 MCM ① 25	 50 – 240 70 – 240 1/0 – 250 MCM ① 25	 50 – 240 70 – 240 1/0 – 250 MCM ① 25	 50 – 240 70 – 240 1/0 – 250 MCM ① 30
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M10 24 213	M10 24 213	M10 24 213	M10 24 213	M10 24 213	M10 24 213
Control Circuit Cable Cross-Sections Solid (mm^2)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Flexible with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or Stranded (AWG)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)	2 x (18 – 12)
Control Circuit Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6
Tools Main cable wrench Control circuit cable pozidriv screwdriver	 16 mm Size 2	 16 mm Size 2	 16 mm Size 2	 16 mm Size 2	 16 mm Size 2	 16 mm Size 2

① Screw tightening with flat cable terminal or cable terminal blocks. See terminal capacity for cable terminal blocks.
② IEC 60947 Standard.

Table 34-110. *XT* Contactors Technical Data and Specifications — Frame L – M (Continued)

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M
General (Continued)						
Mounting Position, AC and DC Operated						
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental						
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	 10g 10g 8g	 10g 10g 8g	 10g 10g 8g	 10g 10g 8g	 10g 10g 8g	 10g 10g 8g
Overvoltage Category/ Pollution Degree	III/3	III/3	III/3	III/3	III/3	III/3
Switching Capacity, kVar ① Individual Compensation 230V 400/420/440V 525V 690V	 87 150 190 150	 — — — —	 — — — —	 115 200 265 200	 — — — —	 — — — —
Group Compensation, with Choke 230V 400/420/440V 525V 690V	 80 150 200 260	 100 175 230 300	 110 190 260 340	 130 225 290 390	 160 280 370 480	 160 280 370 480
Group Compensation, without Choke 230V 400/420/440V 525V 690V	 66 115 145 115	 — — — —	 — — — —	 85 150 195 150	 — — — —	 — — — —

① When using contactors for group compensation, a minimum inductance of approx. 6 uh per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately 140 mm. The conductor cross-section must be selected according to the rated current per phase.

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Frame N – R

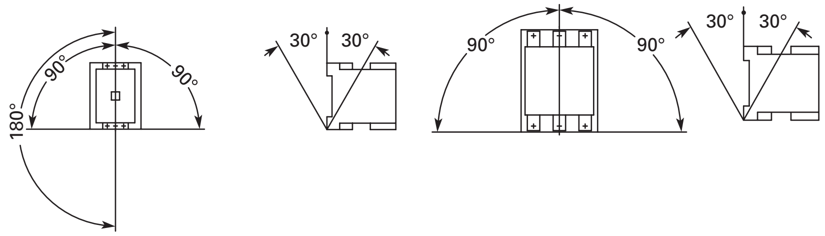
Table 34-111. *XT* Contactors Technical Data and Specifications — Frame N – R

Description	XTCE580N	XTCE650N	XTCE750N, XTCE820N	XTCEC10N	XTCEC14P, XTCEC20R
General					
Standards	IEC/EN 60947, VDE 0660, UL, CSA				
Weights in kg [Lb]	15 [33]	15 [33]	15 [33]	15 [33]	15, 32 [33, 70]
Mechanical Life	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Mechanical Operating Frequency (ops/hr) AC operated DC operated	 1000 1000	 1000 1000	 1000 1000	 1000 1000	 1000 1000
Maximum Operating frequency (ops/hr)	See **Figure 34-43** on **Page 34-83**.				
Climatic Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60 068-2-30				
Insulation Voltage (U_i) V AC	1000	1000	1000	1000	1000
Impulse Withstand Voltage (U_{imp}) V AC	8000	8000	8000	8000	8000
Operating Voltage (U_e) V AC	1000	1000	1000	1000	1000
Safe Isolation to VDE 0106 Part 101 and Part 101/A1 Between coil and contacts (V AC) Between contacts (V AC)	 500 500	 500 500	 500 500	 500 500	 500 500
Making Capacity (Amps)	7800	7800	9840	9840	9840
Breaking Capacity (Amps) 220/230V 380/400V 500V 660/690V 1000V	 6500 6500 6500 6500 4350	 6500 6500 6500 6500 4350	 8200 8200 8200 8200 5800	 8200 8200 8200 8200 5800	 8200 8200 8200 8200 5800
Short-Circuit Protection Rating Maximum Fuse Type 2 Coordination ② 400V; gG/gL 500V 690V; gG/gL 690V 1000V; gG/gL 1000V Type 1 Coordination ② 400V; gG/gL 500V 690V; gG/gL 690V 1000V; gG/gL 1000V	 630 630 500 1000 1000 630	 630 630 500 1000 1000 630	 630 630 630 1200 1200 800	 630 630 630 1200 1200 800	 — — — — — —
Degree of Protection	IP00				
Protection Against Direct Contact when Actuated from Front (Iec 536)	Finger- and back-of-hand proof with terminal shroud or terminal block.				
Main Cable Cross-Section Flexible with cable lug (mm^2) Stranded with cable lug (mm^2) Solid or Stranded (AWG) Flat Conductor (mm) Busbar — Width in mm	 50-240 70-240 2/0 – 500 MCM ① 50	 50-240 70-240 2/0 – 500 MCM ① 50	 50-240 70-240 2/0 – 500 MCM ① 50	 50-240 70-240 2/0 – 500 MCM ① 50	 50-240 70-240 2/0 – 500 MCM ① 50
Main Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M10 24 213	M10 24 213	M12 35 311	M12 35 311	M12 35 311
Control Circuit Cable Cross-Sections Solid (mm^2) Flexible with ferrule (mm^2) Solid or Stranded (AWG)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 2 x (18 – 12)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 2 x (18 – 12)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 2 x (18 – 12)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 2 x (18 – 12)	 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 1 x (0.75 – 2.5) 2 x (0.75 – 2.5) 2 x (18 – 12)
Control Circuit Cable Connection Screw/Bolt Tightening torque Nm Lb-in	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6	M3.5 1.2 10.6

① Screw tightening with flat cable terminal or cable terminal blocks. See terminal capacity for cable terminal blocks.
② IEC 60947 Standard.

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Table 34-111. *XT* Contactors Technical Data and Specifications — Frame N – R (Continued)

Description	XTCE580N	XTCE650N	XTCE750N, XTCE820N	XTCEC10N	XTCEC14N, XTCEC20N
General (Continued)					
Tools Main cable wrench Control circuit cable pozidriv screwdriver	 16 mm Size 2	 16 mm Size 2	 18 mm Size 2	 18 mm Size 2	 18 mm Size 2
Mounting Position, AC and DC Operated					
Ambient Temperature	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]	-25 to 60°C [-13 to 140°F]
Ambient Storage Temperature	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]	-40 to 80°C [-40 to 176°F]
Environmental					
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-sinusoidal shock 10 mS (g) Main contact — NO Contact Auxiliary contact — NO Contact Auxiliary contact — NC Contact	 10 10 8	 10 10 8	 10 10 8	 10 10 8	 10 10 8
Overvoltage Category/Pollution Degree	III/3	III/3	III/3	III/3	III/3
Switching Capacity, kVar ① Individual Compensation 230V 400/420/440V 525V 690V	 175 300 400 300	 — — — —	 — — — —	 — — — —	 — — — —

① When using contactors for group compensation, a minimum inductance of approx. 6 uh per capacitor must be available to limit the high inrush current peaks. This corresponds to an air-cored coil with 5 windings and a coil diameter of approximately 140 mm. The conductor cross-section must be selected according to the rated current per phase.

Instructional Leaflets

Table 34-112. Instructional Leaflets

Publication Number	Description
Pub51210	7 – 15A, B Frame XTCE, XTCEC and XTCF Contactors and Accessories (Inside of Packaging)
Pub51211	18 – 32A, C Frame XTCE and XTCEC Contactors and Accessories (Inside of Packaging)
Pub51221	XTOB, D Frame Overload Relays (Inside of Packaging)
Pub51222	XTOB, B – C Frame Overload Relays (Inside of Packaging)
Pub51237	7 – 12A, B Frame XTCE Contactors and Auxiliary Contacts
Pub51232	18 – 32A, C Frame XTCE Contactors and Auxiliary Contacts
Pub51216	40 – 65A, D Frame XTCE Contactors and Auxiliary Contacts
Pub51203	185 – 500A, L – M Frame XTCE Contactors and Auxiliary Contacts
Pub51215	S-Series 185 – 500A, L – M Frame XTCE Contactors and Auxiliary Contacts
Pub51204	580 – 1000A, N Frame XTCE Contactors and Auxiliary Contacts
Pub51209	1400 – 2000A, P – R Frame XTCE Contactors and Auxiliary Contacts
Pub51213	7 – 150A, B – G Frame XTAE Non-reversing and XTAR Reversing Starters
Pub51217	XTCEXFA and XTCEXSA Front and Side Mount Auxiliary Contacts from 40 – 150A, D – G Frame XTCE Contactors
Pub51212	XTCEXML Mechanical Interlock for 7 – 150A, B – G Frame XTCE Contactors
Pub51214	XTCEXRL Reversing Link Kits for 18 – 32A, C Frame XTCE Contactors
Pub51218	XTCEXTL Lug Kits for 500 – 820A, M – N Frame XTCE Contactors
Pub51219	XTCEXRLB and XTCEXSDLB Reversing and Star-Delta (Wye-Delta) Link Kits for 7 – 12A, B Frame XTCE Contactors
Pub51205	Accessories for 185 – 500A, L – M Frame XTCE Contactors
Pub51207	Replacement DC Coils
Pub51213	Renewal Parts — Coils for 18 – 32A, C Frame XTCE Contactors
Pub51186	Renewal Parts — Coils for 40 – 65A, D Frame XTCE Contactors

Coil Data

Frame B – D

Table 34-113. Coil Data — Frame B – D

	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C	XTCE040D	XTCE050D	XTCE065D
Voltage Tolerance										
Pick-Up (x U_C)										
AC operated	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
DC operated	0.8 – 1.1 ①	0.8 – 1.1 ①	0.8 – 1.1 ①	0.8 – 1.1 ①	0.7 – 1.2 ②	0.7 – 1.2 ②	0.7 – 1.2 ②	0.7 – 1.2 ②	0.7 – 1.2 ②	0.7 – 1.2 ②
Drop-Out (x U_C)										
AC operated	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6	0.3 – 0.6
DC operated	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6
Power Consumption of the coil at cold state and 1.0 x U_C										
AC operated										
Single-voltage coil 50 Hz										
Pick-Up VA	24	24	24	24	52	52	52	149	149	149
Pick-Up W	19	19	19	19	40	40	40	80	80	80
Sealing VA	3.4	3.4	3.4	3.4	7.1	7.1	7.1	16	16	16
Sealing W	1.2	1.2	1.2	1.2	2.1	2.1	2.1	4.3	4.3	4.3
Single-voltage coil 60 Hz										
Pick-Up VA	30	30	30	30	67	67	67	178	178	178
Pick-Up W	23	23	23	23	50	50	50	117	117	117
Sealing VA	4.4	4.4	4.4	4.4	8.7	8.7	8.7	19	19	19
Sealing W	1.4	1.4	1.4	1.4	2.6	2.6	2.6	5.3	5.3	5.3
50/60 Hz										
Pick-Up VA	27	27	27	27	62	62	62	168	168	168
	25	25	25	25	58	58	58	154	154	154
Pick-Up W	22	22	22	22	48	48	48	120	120	120
	21	21	21	21	43	43	43	43	43	43
Sealing VA	4.2	4.2	4.2	4.2	9.1	9.1	9.1	22	22	22
	3.3	3.3	3.3	3.3	6.5	6.5	6.5	14	14	14
Sealing W	1.4	1.4	1.4	1.4	2.5	2.5	2.5	5.3	5.3	5.3
	1.2	1.2	1.2	1.2	2	2	2	4.3	4.3	4.3
DC operated										
Pick-Up W	3	3	4.5	4.5	12 at 24V	12 at 24V	12 at 24V	24 at 24V	24 at 24V	24 at 24V
Sealing W	3	3	4.5	4.5	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V	0.5 at 24V
Duty Factor (%DF)	100	100	100	100	100	100	100	100	100	100
Switching Time at 100% U_C (approximate values)										
Main Contact										
AC operated										
Closing delay (mS)	<21	<21	<21	<21	<22	<22	<22	<18	<18	<18
Opening delay (mS)	<18	<18	<18	<18	<14	<14	<14	<13	<13	<13
DC operated										
Closing delay (mS)	<31	<31	<31	<31	<47	<47	<47	<54	<54	<54
Opening delay (mS)	<12	<12	<12	<12	<30	<30	<30	<24	<24	<24
Arcing time (mS)	10	10	10	10	10	10	10	10	10	10
Electromagnetic Compatibility (EMC)										
Emitted interference	To EN-60947-1									
Noise Immunity	To EN-60947-1									

① 0.7 – 1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

② Coil Suffix TD: U_{min} 24V DC/U_{max} 27V DC.
Coil Suffix WD: U_{min} 48V DC/U_{max} 60V DC.
Coil Suffix AD: U_{min} 110V DC/U_{max} 130V DC.
Coil Suffix BD: U_{min} 200V DC/U_{max} 240V DC.
Example:
U_c = 0.7 x U_{min} — 1.2 x U_{max}
U_c = 0.7 x 24V — 1.2 x 27V DC

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Frame F – G

Table 34-114. Coil Data — Frame F – G

	XTCE80F	XTCE95F	XTCE115G	XTCE150G
Voltage Tolerance				
Pick-Up (x U_C)				
AC operated	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1	0.8 – 1.1
DC operated	0.7 – 1.2 ①	0.7 – 1.2 ①	0.7 – 1.2 ①	0.7 – 1.2 ①
Drop-Out (x U_C)				
AC operated	0.3 – 0.6	0.3 – 0.6	0.25 – 0.6	0.25 – 0.6
DC operated	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6	0.15 – 0.6
Power Consumption of the coil at cold state and 1.0 x U_C				
AC operated				
Single-voltage coil 50 Hz				
Pick-Up VA	310	310	180	180
Pick-Up W	165	165	130	130
Sealing VA	26	26	3.1	3.1
Sealing W	5.8	5.8	2.1	2.1
Single-voltage coil 60 Hz				
Pick-Up VA	345	345	170	170
Pick-Up W	190	190	130	130
Sealing VA	30	30	3.1	3.1
Sealing W	7.1	7.1	2.1	2.1
50/60 Hz				
Pick-Up VA	372	328	170	170
Pick-Up W	190	190	130	130
Sealing VA	37.1	22.6	3.1	3.1
Sealing W	7.5	6.1	2.1	2.1
DC operated				
Pick-Up W	90 at 24V	90 at 24V	149 at 24V	149 at 24V
Sealing W	1.3 at 24V	1.3 at 24V	2.1 at 24V	2.1 at 24V
Duty Factor (%DF)	100	100	100	100
Switching Time at 100% U_C (approximate values)				
Main Contact				
AC operated				
Closing delay (mS)	<20	<20	<33	<33
Opening delay (mS)	<14	<14	<41	<41
DC operated				
Closing delay (mS)	<45	<45	<35	<35
Opening delay (mS)	<34	<34	<30	<30
Arcing Time (mS)	15	15	15	15
Permissible Residual Current with Actuation of A1 – A2 By the Electronics (with 0 signal) (mA)	≤ 1	≤ 1	≤ 1	≤ 1
Electromagnetic Compatibility (EMC)				
Emitted interference	To EN60947-1			
Noise Immunity	To EN60947-1			

① At 24V: 0.7 – 1.3 without additional auxiliary contact modules and ambient temperature +40°C [104°F].

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Frame L – R

Table 34-115. Coil Data — Frame L – R

Description	XTCE185L	XTCE225L, XTCE250L	XTCE300M, XTCE400M	XTCE500M
Voltage Tolerance				
Pick-Up (x U_C) XTCE185L – XTCEC20R XTCS185L – XTCS500M Drop-Out (x U_C) XTCE185L – XTCEC20R XTCS185L – XTCS500M	 0.7 x U_{cmin} — 1.15 x U_{cmax} 0.85 x U_{cmin} — 1.1 x U_{cmax} 0.2 x U_{cmin} — 0.6 x U_{cmax} 0.2 x U_{cmin} — 0.4 x U_{cmax}			
Power Consumption of the coil at cold state and 1.0 x U_C				
XTCE185L – XTCEC20R Pick-Up VA Pick-Up W Sealing VA Sealing W	 250 ① 200 4.3 3.3	 250 ① 200 4.3 3.3	 450 ① 350 4.3 3.3	 450 ① 350 4.3 3.3
XTCS185L – XTCS500M Pick-Up VA Pick-Up W Sealing VA Sealing W	 360 325 4.3 3.3	 360 325 4.3 3.3	 715 645 4.3 3.3	 715 645 4.3 3.3
Duty Factor (%DF)	100	100	100	100
Switching Time at 100% Main Contact U_C (approximate values)				
XTCE185L – XTCEC20R Closing delay (mS) Opening delay (mS) XTCS185L – XTCS500M Closing delay (mS) Opening delay (mS)	 <100 <80 <50 <40	 <100 <80 <50 <40	 <80 <80 <50 <40	 <80 <80 <50 <40
Reaction in Threshold and Sealing State Transition Range (XTCE185L – XTCEC20R)				
Voltage interruptions (0 – 0.2 x U_{cmin}) ≤ 10ms (0 – 0.2 x U_{cmin}) > 10ms	 Time is bridged successfully Drop-out of the contactor			
Voltage Dips (0.2 – 0.6 x U_{cmin}) ≤ 12ms (0.2 – 0.6 x U_{cmin}) > 12ms (0.6 – 0.7 x U_{cmin})	 Time is bridged successfully Drop-out of the contactor Contactor remains switched on			
Excess Voltage (1.15 – 1.3 x U_{cmax}) (>1.3 x U_{cmax}) ≤ 3s (>1.3 x U_{cmax}) > 3s	 Contactor remains switched on Contactor remains switched on Drop-out of the contactor			
Pick – Up phase (0 – 0.7 x U_{cmin}) (0.7 x U_{cmin} –1.15 x U_{cmax}) (>1.15 x U_{cmax})	 Contactor does not switch on Contactor switches on with certainty Contactor switches on with certainty			
Permissible contact resistance (of the external command device with actuation of A11), Ω	≤ 500	≤ 500	≤ 500	≤ 500
Permissible residual current (with actuation of A11 by the electronics with 0 signal)	≤ 1	≤ 1	≤ 1	≤ 1
SPS Signal Level (A3 – A4) to IEC/EN 61131-2 (Type 2) High Low	 15V 5V	 15V 5V	 15V 5V	 15V 5V
Electromagnetic compatibility (EMC)	This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.			

① Control transformer with U_k ≤6%.

Table 34-115. Coil Data — Frame L – R (Continued)

Description	XTCE580N	XTCE750N, XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
Voltage Tolerance					
Pick-Up (x U_C) XTCE185L – XTCEC20R XTCS185L – XTCS500M Drop-Out (x U_C) XTCE185L – XTCEC20R XTCS185L – XTCS500M	 0.7 x U_{cmin} — 1.15 x U_{cmax} 0.85 x U_{cmin} — 1.1 x U_{cmax} 0.2 x U_{cmin} — 0.6 x U_{cmax} 0.2 x U_{cmin} — 0.4 x U_{cmax}				
Power Consumption of the coil at cold state and 1.0 x U_C					
XTCE185L – XTCEC20R Pick-Up VA Pick-Up W Sealing VA Sealing W	 800 ① 700 7.5 6.5	 800 ① 700 7.5 6.5	 800 ① 700 7.5 6.5	 800 ① 700 7.5 6.5	 1600 ① 1400 15 13
XTCS185L — XTCS500M Pick-Up VA Pick-Up W Sealing VA Sealing W	 — — — —	 — — — —	 — — — —	 — — — —	 — — — —
Duty Factor (%DF)	100	100	100	100	100
Switching Time at 100% Main Contact U_C (approximate values)					
XTCE185L – XTCEC20R Closing delay (mS) Opening delay (mS) XTCS185L – XTCS500M Closing delay (mS) Opening delay (mS)	 <70 <70 — —	 <70 <70 — —	 <70 <70 — —	 <70 <40 — —	 <70 <40 — —
Reaction in Threshold and Sealing State Transition Range (XTCE185L – XTCEC20R)					
Voltage interruptions (0 – 0.2 x U_{cmin}) ≤ 10ms (0 – 0.2 x U_{cmin}) > 10ms	 Time is bridged successfully Drop-out of the contactor				
Voltage Dips (0.2 – 0.6 x U_{cmin}) ≤ 12ms (0.2 – 0.6 x U_{cmin}) > 12ms (0.6 – 0.7 x U_{cmin})	 Time is bridged successfully Drop-out of the contactor Contactor remains switched on				
Excess Voltage (1.15 – 1.3 x U_{cmax}) (>1.3 x U_{cmax}) ≤ 3s (>1.3 x U_{cmax}) > 3s	 Contactor remains switched on Contactor remains switched on Drop-out of the contactor				
Pick – Up phase (0 – 0.7 x U_{cmin}) (0.7 x U_{cmin} –1.15 x U_{cmax}) (>1.15 x U_{cmax})	 Contactor does not switch on Contactor switches on with certainty Contactor switches on with certainty				
Permissible contact resistance (of the external command device with actuation of A11), Ω	≤ 500	≤ 500	≤ 500	≤ 500	≤ 500
Permissible residual current (with actuation of A11 by the electronics with 0 signal)	≤ 1	≤ 1	≤ 1	≤ 1	≤ 1
SPS Signal Level (A3 – A4) to IEC/EN 61131-2 (Type 2) High Low	 15V 5V	 15V 5V	 15V 5V	 15V 5V	 15V 5V
Electromagnetic compatibility (EMC)	This product is designed for operation in industrial environments. Usage in domestic areas can cause radio frequency interference (RFI). Noise suppression measures must be provided for the additional interference.				

① Control transformer with U_k ≤7%.

Contactor Contact Travel Diagrams

The diagrams indicate the closing and travel of the contacts of the contactors and auxiliary contacts at no-load. Tolerances are not taken into consideration.

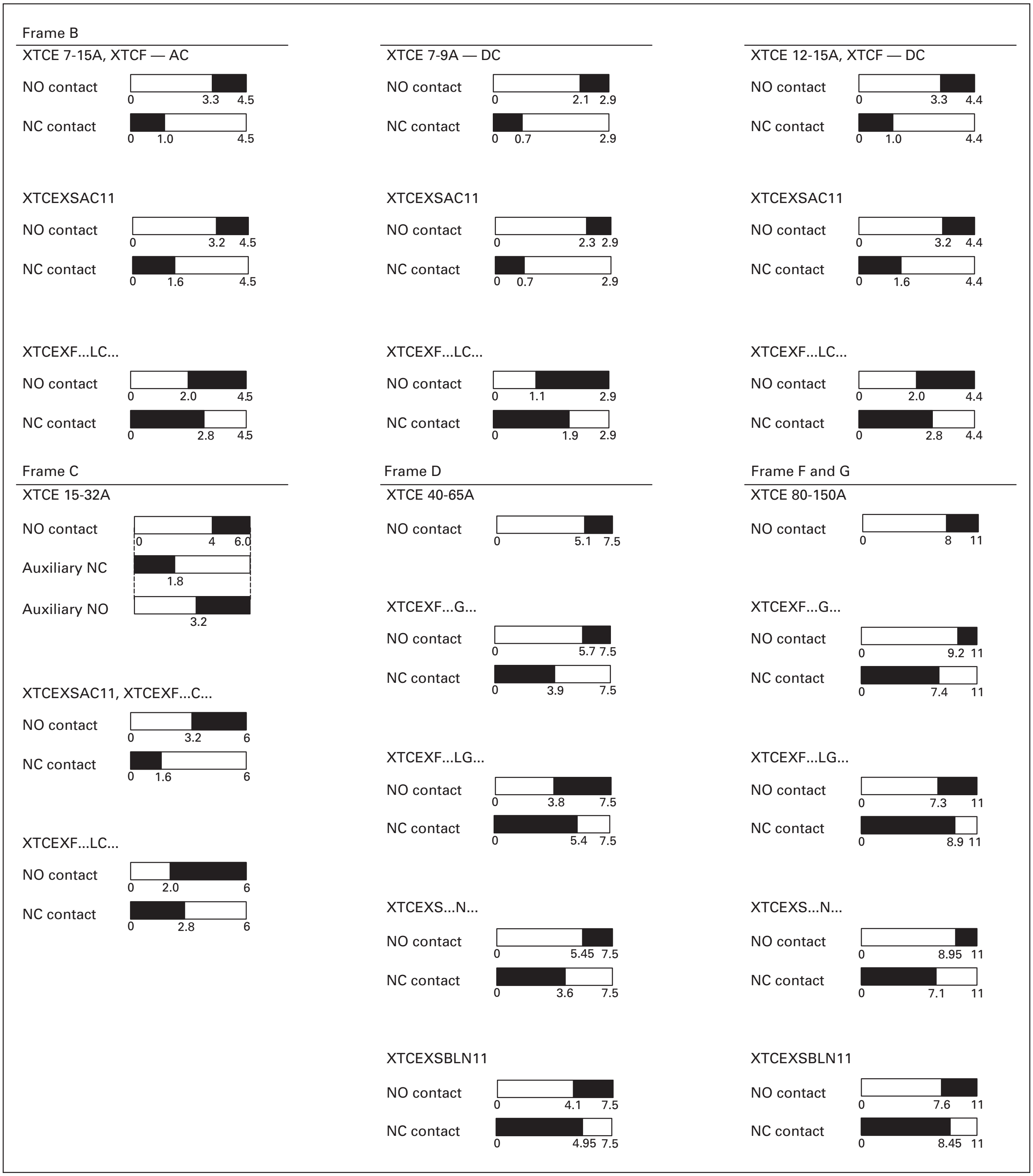


Figure 34-38. Contactor Contact Travel Diagrams

Auxiliary Contacts

Table 34-116. Auxiliary Contacts Technical Data and Specifications

Description	XTCE007B…– XTCE032C	XTCEXFAC… XTCEXFATC...	XTCEXFCC… XTCEXSCC...	XTCEXFAG…	XTCEXSBLN… XTCEXSBN… XTCEXSBNC... XTCEXSCN… XTCEXSCNC…
Interlocked opposing contacts with an auxiliary contact module (to IEC 60947-5 -1 Annex L)	—	Yes	Yes	Yes	Yes
Break contact (not late-break contact) suitable as a mirror contact (to IEC/EN 60947-4 -1 Annex F)	XTCE007B… – XTCE032C	XTCE007B… – XTCE032C	XTCE007B… – XTCE032C	XTCE040D… – XTCE065D…	XTCE040D… – XTCE065D… XTCE185L… – XTCEC10N…
Rated impulse withstand voltage, (U_{imp}) V AC	6000	6000	6000	6000	6000
Overvoltage category / pollution degree	III/3	III/3	III/3	III/3	III/3
Rated insulation voltage, (U_i) V AC	690	690	690	690	690
Rated operational voltage, (U_e) V AC	500	500	500	500	500
Safe isolation to VDE 0106 Part 101 and Part 101(A) in V AC					
Between coil and auxiliary contacts	400	400	400	440	440
Between the auxiliary contacts	400	400	400	440	440
Rated Operational Current, I_e					
AC-15					
230V	6A	6A	6A	6A	6A
380/415V	4A	3A	4A	4A	4A
500V	1.5A	—	1.5A	1.5A	1.5A
DC-3 L/R ≤5 mS ①					
24V	10A	10A	10A	10A	10A
60V	6A	6A	6A	6A	6A
110V	3A	3A	3A	3A	3A
220V	1A	1A	1A	1A	1A
Conventional thermal current, I_{th}	16A	16A	16A ③	10A	10A
Control circuit reliability (at U_e = 24 V DC, U_{min} = 17 V, I_{min} = 5.4 mA)	$<10^{-8}$, < one failure at 100 million operations				
Component Lifespan, Operations x 10^6 at U_e = 230V, AC-15, 3A	1.3	1.3	1.3	1.3	1.3
Short-circuit rating without welding ② Maximum fuse, gG/gL	10A	10A	10A	16A	16A

① Making and breaking conditions to DC-13, time L/R contact as stated.
② See fuses overlay for time/current characteristic (on request).
③ Conventional thermal current (I_{th}) of XTCEXSCC_ is 10A.

Table 34-117. Parallel Link Technical Data and Specifications

Description	XTCEXPLKB	XTECXPLKC	XTCEXPLKD	XTCEXPLKG	XTCEXPLK185
Terminal Capacity					
Solid (mm^2)	1 – 16	16	16	—	—
Flexible with ferrule (mm^2)	1 x (0.5 – 25) 2 x (0.5 – 16)	1 x (16 – 35)	1 x (16 – 120)	—	—
Stranded (mm^2)	1 x (0.5 – 25) 2 x (0.5 – 16)	1 x (16 – 50)	1 x (16 – 120)	1 x (35 – 300) 2 x (35 – 120)	—
Flat conductor — number of segments x width x thickness (mm)	6 x 9 x 0.8	—	—	2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)
Tightening Torque (Nm)	4	4	14	—	—
Tools					
Pozidriv screwdriver	Size 2	Size 2	—	—	—
Hexagon socket head spanner — SW (mm)	—	—	5	6	—
Conventional Thermal Current					
3-Pole (I_{th}) A	50	100	180	400	—
4-Pole (I_{th}) A	60	—	—	—	—

Table 34-118. Cable Terminal Block, Flat Cable Terminal Technical Data and Specifications

Description	XTCEXTLA225	XTCEXTLA400	XTCEXPLK185	XTCEXTFB650	XTCEXTFB820
Terminal Capacity					
Stranded (mm^2)	1 x (16 – 185) 2 x (16 – 150)	1 x (120 – 300) 2 x (70 – 240)	—	—	—
Stranded (AWG)	1 x (6 – 350 MCM) 2 x (6 – 300 MCM)	1 x (1/0 – 600 MCM) 2 x (1/0 – 500 MCM)	—	—	—
Flat conductor — number of segments x width x thickness (mm)	1 x (3 x 9 x 0.8) 2 x (10 x 16 x 0.8)	1 x (10 x 16 x 0.8) 2 x (20 x 24 x 0.5) 2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (20 x 32 x 0.5) 2 x (11 x 21 x 1)	1 x (6 x 16 x 0.8) 2 x (10 x 40 x 1) 2 x (20 x 40 x 0.5)

AC Ratings

Table 34-119. AC Ratings

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
Open							
at 40°C (I_{th})	22A	22A	22A	22A	40A	45A	45A
at 50°C (I_{th})	21A	21A	21A	21A	38A	43A	43A
at 55°C (I_{th})	21A	21A	21A	21A	37A	42A	42A
at 60°C (I_{th})	20A	20A	20A	20A	35A	40A	40A
Enclosed	18A	18A	18A	18A	32A	36A	36A
Conventional Free Air Thermal Current, 1-Pole (I_{th})							
Open	50A	50A	50A	50A	85A	85A	85A
Enclosed	45A	45A	45A	45A	80A	80A	80A
AC-3 Operation							
Rated Operational Current, 50/60 Hz [1] (I_e) in amperes							
220/230V	7	9	12	15.5	18	25	32
240V	7	9	12	15.5	18	25	32
380/400V	7	9	12	15.5	18	25	32
415V	7	9	12	15.5	18	25	32
440V	7	9	12	15.5	18	25	32
500V	5	7	10	12.5	18	25	32
660/690V	4	5	7	9	12	15	18
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	2.2	2.5	3.5	4	5	7.5	10
240V	2.2	3	4	4.6	5.5	8.5	11
380/400V	3	4	5.5	7.5	7.5	11	15
415V	4	5.5	7	8	10	14.5	19
440V	4.5	5.5	7.5	8.4	10.5	15.5	20
500V	3.5	4.5	7	7.5	12	17.5	23
660/690V	3.5	4.5	6.5	7	11	14	17
1000V	—	—	—	—	—	—	—
AC-4 Operation							
Rated Operational Current, 50/60 Hz [1] (I_e) in amperes							
220/230V	5	6	7	7	10	13	15
240V	5	6	7	7	10	13	15
380/400V	5	6	7	7	10	13	15
415V	5	6	7	7	10	13	15
440V	5	6	7	7	10	13	15
500V	4.5	5	6	6	10	13	15
660/690V	4	4.5	5	5	8	10	12
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	1	1.5	2	2	2.5	3.5	4
240V	1.5	1.6	2.2	2.2	3	4	4.5
380/400V	2.2	2.5	3	3	4.5	6	7
415V	2.3	2.8	3.4	3.4	5	6.5	7.5
440V	2.4	3	3.6	3.6	5.5	7	8
500V	2.5	2.8	3.5	3.5	6	8	9
660/690V	2.9	3.6	4.4	4.4	6.5	8.5	10
1000V	—	—	—	—	—	—	—
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is $I_{eAC\text{-}3}$ = X / 6 * I_e Transformer where X is the inrush current of the transformer and I_e Transformer is the nominal current. [2]						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes Up to 525V 690V	See **Page 34-48** for Capacitor Ratings						
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	—	—	—	—	—	—	—
Maximum Operating Frequency (ops/hr)	—	—	—	—	—	—	—

[1] At maximum permissible ambient temperature.

[2] Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

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Table 34-119. AC Ratings (Continued)

Description	XTCE040D	XTCE050D	XTCE065D	XTCE080F	XTCE095F	XTCE115G	XTCE150G
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
Open							
at 40°C (I_{th})	60A	80A	98A	110A	130A	160A	190A
at 50°C (I_{th})	57A	71A	88A	98A	125A	142A	180A
at 55°C (I_{th})	55A	68A	83A	94A	115A	135A	170A
at 60°C (I_{th})	50A	65A	80A	90A	110A	130A	160A
Enclosed	45A	58A	72A	80A	100A	115A	144A
Conventional Free Air Thermal Current, 1-Pole (I_{th})							
Open	125A	162A	200A	225A	275A	325A	400A
Enclosed	112A	145A	180A	200A	250A	285A	360A
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	40	50	65	80	95	115	150
240V	40	50	65	80	95	115	150
380/400V	40	50	65	80	95	115	150
415V	40	50	65	80	95	115	150
440V	40	50	65	80	95	115	150
500V	40	50	65	80	95	115	150
660/690V	25	32	37	65	80	93	100
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	12.5	15.5	20	25	30	37	48
240V	13.5	17	22	27.5	34	40	52
380/400V	18.5	22	30	37	45	55	75
415V	24	30	39	43	57	70	91
440V	25	32	41	51	60	75	95
500V	28	36	47	58	70	85	110
660/690V	23	30	35	63	75	90	96
1000V	—	—	—	—	—	—	—
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	18	21	25	40	50	55	65
240V	18	21	25	40	50	55	65
380/400V	18	21	25	40	50	55	65
415V	18	21	25	40	50	55	65
440V	18	21	25	40	50	55	65
500V	18	21	25	40	50	55	65
660/690V	14	17	20	40	50	45	50
1000V	—	—	—	—	—	—	—
Rated power (P) in kilowatts							
220/230V	5	6	7	12	16	17	20
240V	5.5	6.5	7.5	13	17	19	22
380/400V	9	10	12	20	26	28	33
415V	9.5	11	13	24	30	33	39
440V	10	12	14	25	32	35	41
500V	11	13	16	29	36	40	47
660/690V	12	14	17	26	35	43	48
1000V	—	—	—	—	—	—	—
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is $I_{eAC-3} = X / 6 * I_{e}$ Transformer where X is the inrush current of the transformer and I_e Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes Up to 525V 690V	See **Page 34-48** for Capacitor Ratings						
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	—	—	—	—	—	—	—
Maximum Operating Frequency (ops/hr)	—	—	—	—	—	—	—

① At maximum permissible ambient temperature.
② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

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Table 34-119. AC Ratings (Continued)

Description	XTCE185L	XTCE225L	XTCE250L	XTCE300M	XTCE400M	XTCE500M	XTCE580N
AC-1 Operation							
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz							
at 40°C (I_{th})	337	386	429	490	612	857	980
at 50°C (I_{th})	301	345	383	438	548	767	876
at 55°C (I_{th})	287	329	366	418	522	731	836
at 60°C (I_{th})	275	315	350	400	500	700	800
Conventional Free Air Thermal Current, 1-Pole (I_{th})	685	785	875	1000	1250	1750	2000
AC-3 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	185	225	250	300	400	500	580
240V	185	225	250	300	400	500	580
380/400V	185	225	250	300	400	500	580
415V	185	225	250	300	400	500	580
440V	185	225	250	300	400	500	580
500V	185	225	250	300	400	500	580
660/690V	185	225	250	300	400	500	580
1000V	76	76	76	95	95	95	435
Rated power (P) in kilowatts							
220/230V	55	70	75	90	125	155	185
240V	62	75	85	100	132	170	200
380/400V	90	110	132	160	200	250	315
415V	110	132	148	180	240	300	348
440V	115	142	157	190	255	345	370
500V	132	160	180	215	290	360	420
660/690V	175	215	240	286	344	344	560
1000V	108	108	108	132	132	132	600
AC-4 Operation							
Rated Operational Current, 50/60 Hz ① (I_e) in amperes							
220/230V	136	164	200	240	296	360	456
240V	136	164	200	240	296	360	456
380/400V	136	164	200	240	296	360	456
415V	136	164	200	240	296	360	456
440V	136	164	200	240	296	360	456
500V	136	164	200	240	296	360	456
660/690V	136	164	200	240	296	296	456
1000V	76	76	76	95	95	95	348
Rated power (P) in kilowatts							
220/230V	41	51	62	75	92	112	143
240V	45	54	68	82	101	122	156
380/400V	75	90	110	132	160	200	250
415V	80	96	117	142	176	216	274
440V	85	102	125	151	186	229	290
500V	96	116	143	172	214	260	330
660/690V	127	155	189	229	283	344	440
1000V	108	108	108	132	132	132	509
AC-6A Operation							
Transformer Loads	Values are application specific. Calculation is $I_{eAC\text{-}3} = X / 6 * I_e$ Transformer where X is the inrush current of the transformer and I_e Transformer is the nominal current. ②						
AC-6B Operation							
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes							
Up to 525V	220	220	220	307	307	307	463
690V	133	133	133	177	177	177	265
Maximum inrush current peak (x I_e)	30	30	30	30	30	30	30
Component Lifesaving (Operations)	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Maximum Operating Frequency (ops/hr)	200	200	200	200	200	200	200

① At maximum permissible ambient temperature.

② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

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Table 34-119. AC Ratings (Continued)

Description	XTCE650N	XTCE750N	XTCE820N	XTCEC10N	XTCEC14P	XTCEC20R
AC-1 Operation						
Conventional Free Air Thermal Current, 3-Pole, 50 – 60 Hz						
at 40°C (I_{th})	1041	1102	1225	1225	1714	2450
at 50°C (I_{th})	931	986	1095	1095	1533	2190
at 55°C (I_{th})	888	940	1044	1044	1462	2089
at 60°C (I_{th})	850	900	1000	1000	1400	2000
Conventional Free Air Thermal Current, 1-Pole (I_{th})	2125	2250	2500	2500	3500	5000
AC-3 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes						
220/230V	650	750	820	1000	—	—
240V	650	750	820	1000	—	—
380/400V	650	750	820	1000	—	—
415V	650	750	820	1000	—	—
440V	650	750	820	1000	—	—
500V	650	750	820	1000	—	—
660/690V	650	750	820	1000	—	—
1000V	435	580	580	700	—	—
Rated power (P) in kilowatts						
220/230V	205	240	260	315	—	—
240V	225	260	285	340	—	—
380/400V	355	400	450	560	—	—
415V	390	455	500	610	—	—
440V	420	480	525	650	—	—
500V	470	550	600	730	—	—
660/690V	630	720	750	1000	—	—
1000V	600	800	800	1000	—	—
AC-4 Operation						
Rated Operational Current, 50/60 Hz ① (I_e) in amperes						
220/230V	512	576	656	800	—	—
240V	512	576	656	800	—	—
380/400V	512	576	656	800	—	—
415V	512	576	656	800	—	—
440V	512	576	656	800	—	—
500V	512	576	656	800	—	—
660/690V	512	576	656	800	—	—
1000V	348	464	464	700	—	—
Rated power (P) in kilowatts						
220/230V	161	181	209	260	—	—
240V	176	200	228	280	—	—
380/400V	280	315	355	450	—	—
415V	307	346	394	490	—	—
440V	326	367	418	520	—	—
500V	370	417	474	590	—	—
660/690V	494	556	633	780	—	—
1000V	509	678	678	1000	—	—
AC-6A Operation						
Transformer Loads	Values are application specific. Calculation is I_{eAC-3} = X / 6 * I_e Transformer where X is the inrush current of the transformer and I_e Transformer is the nominal current. ②					
AC-6B Operation						
Capacitor Loads Individual compensation rated operational current I_e of three-phase capacitors in amperes						
Up to 525V	463	463	463	463	—	—
690V	265	265	265	265	—	—
Maximum inrush current peak (x I_e)	30	30	30	30	—	—
Component Lifesaving (Operations)	100,000	100,000	100,000	100,000	—	—
Maximum Operating Frequency (ops/hr)	200	200	200	200	—	—

① At maximum permissible ambient temperature.
② Example —
The transformer has a nominal current of 10A with an inrush current of 18 times the nominal current. So, the contactor must have an AC-3 current of 18/6 x 10A = 30A. Using an XTCE032C (32A AC-3) contactor is recommended.

34

DC Ratings

Table 34-120. DC Ratings — DC-1

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	40	40
110V	20	20	20	20	35	40	40
220V	15	15	15	15	35	40	40
440V	1	1.3	1.3	1.3	2.9	2.9	2.9
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	110	110	160	160
110V	50	50	72	110	110	160	160
220V	45	45	65	70	70	90	90
440V	2.9	2.9	2.9	4.5	4.5	4.5	4.5
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	11	11	11	11	11	11	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Table 34-121. DC Ratings — DC-3

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	35	40
110V	20	20	20	20	35	35	40
220V	1.5	1.5	1.5	1.5	10	10	25
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	110	110	160	160
110V	50	50	72	110	110	160	160
220V	25	25	35	35	35	40	40
440V	0.6	0.6	0.6	1	1	1	1
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Table 34-122. DC Ratings — DC-5

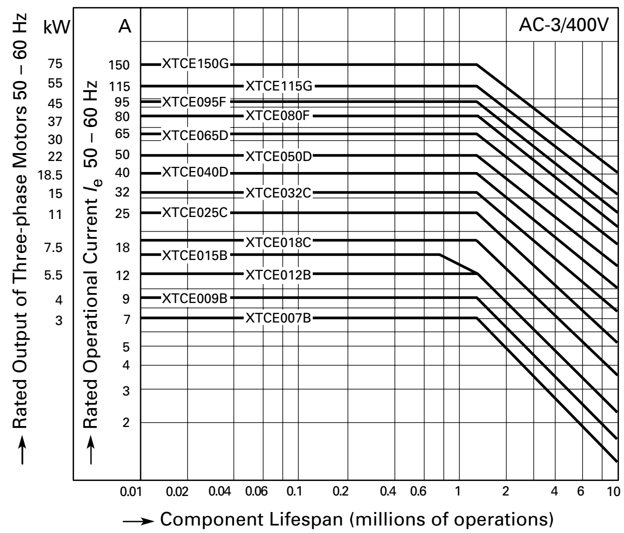
Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Rated operation current {1} (I_e) in amperes							
60V	20	20	20	20	35	35	40
110V	20	20	20	20	35	35	40
220V	1.5	1.5	1.5	1.5	10	10	25
440V	0.2	0.2	0.2	0.2	0.6	0.6	0.6
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
60V	50	60	72	110	110	160	160
110V	50	50	72	110	110	160	160
220V	25	25	35	35	35	40	40
440V	0.6	0.6	0.6	1	1	1	1
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
60V	300	300	300	400	400	400	—
110V	300	300	300	400	400	400	—
220V	300	300	300	400	400	400	—
440V	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
60V	—	—	—	—	—	—	—
110V	—	—	—	—	—	—	—
220V	—	—	—	—	—	—	—
440V	—	—	—	—	—	—	—

Heat Loss

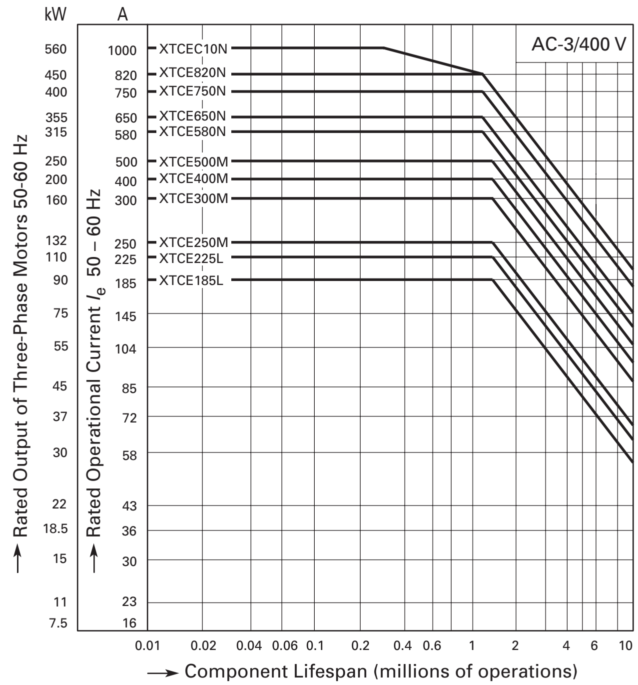
Table 34-123. Current heat loss (3-Pole) in watts

Description	XTCE007B	XTCE009B	XTCE012B, XTCF020B	XTCE015B	XTCE018C	XTCE025C	XTCE032C
Current heat loss (3-Pole) in watts							
at I_{th}	3	3	3	3	7.3	9.6	12.1
at I_e to AC-3/400V	0.37	0.6	1.1	1.8	1.9	3.8	6.1
Impedance per pole, mΩ	2.5	2.5	2.5	2.5	2	2	2
	XTCE040D	**XTCE050D**	**XTCE065D**	**XTCE080F**	**XTCE095F**	**XTCE115G**	**XTCE150G**
Current heat loss (3-Pole) in watts							
at I_{th}	11.3	19	28.8	14.6	21.8	30.4	46.1
at I_e to AC-3/400V	7.2	11.3	19	11.5	16.2	23.8	40.5
Impedance per pole, mΩ	1.5	1.5	1.5	0.6	0.6	0.6	0.6
	XTCE185L	**XTCE225L**	**XTCE250L**	**XTCE300M**	**XTCE400M**	**XTCE500M**	**XTCE580N**
Current heat loss (3-Pole) in watts							
at I_{th}	79	108	95	123	188	236	227
at I_e to AC-3/400V	36	55	48	69	120	120	120
Impedance per pole, mΩ	—	—	—	—	—	—	—
	XTCE650N	**XTCE750N**	**XTCE820N**	**XTCEC10N**	**XTCEC14P**	**XTCEC20R**	**—**
Current heat loss (3-Pole) in watts							
at I_{th}	257	288	355	355	697	711	—
at I_e to AC-3/400V	150	200	239	355	—	—	—
Impedance per pole, mΩ	—	—	—	—	—	—	—

Life Curves

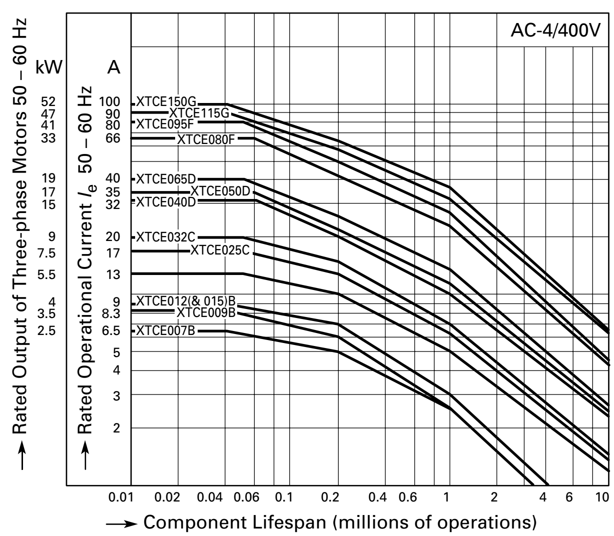


XTCE007B – XTCE150G

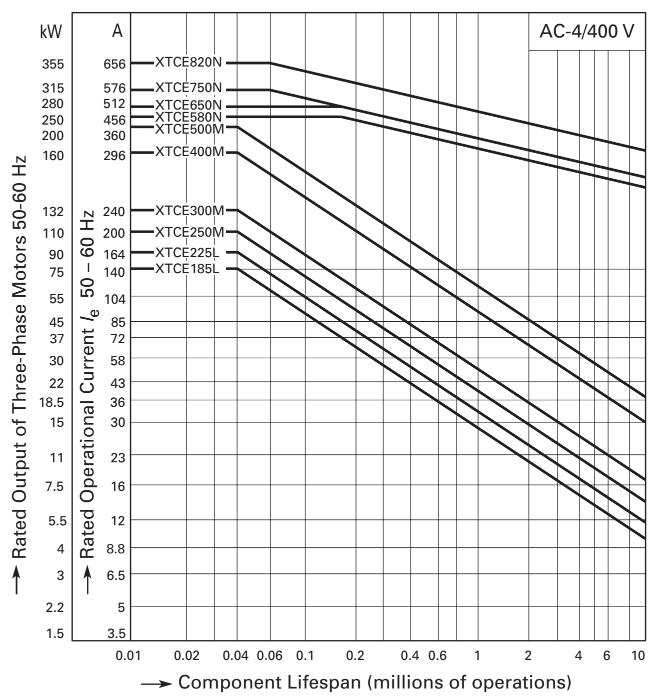


XTCE185L – XTCEC10N

Figure 34-39. Normal Switching Duty



XTCE007B – XTCE150G



XTCE185L – XTCE820N

Figure 34-40. Extreme Switching Duty

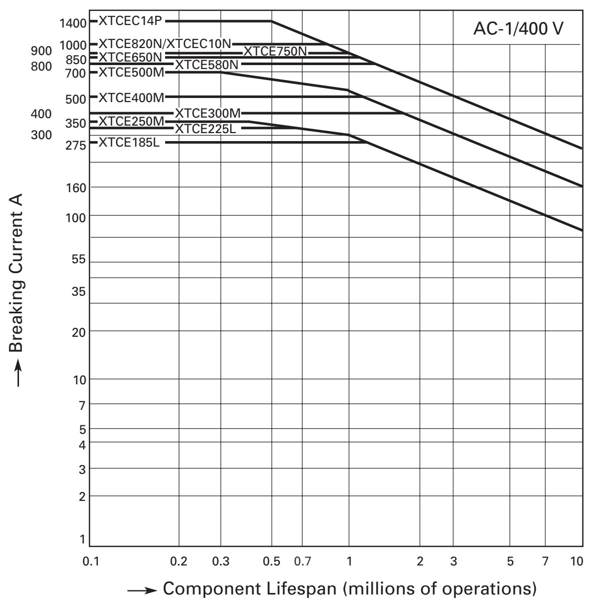


Figure 34-41. Switching Duty for Non-motor loads, 3-pole, 4-pole — XTCE185L – XTCEC14P

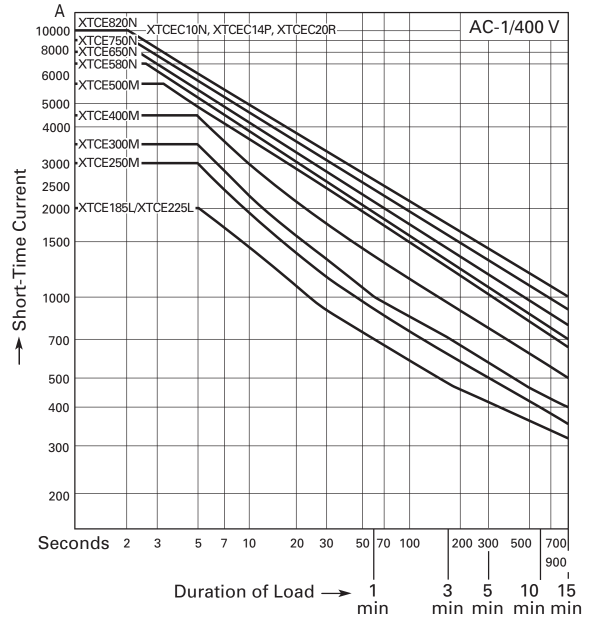
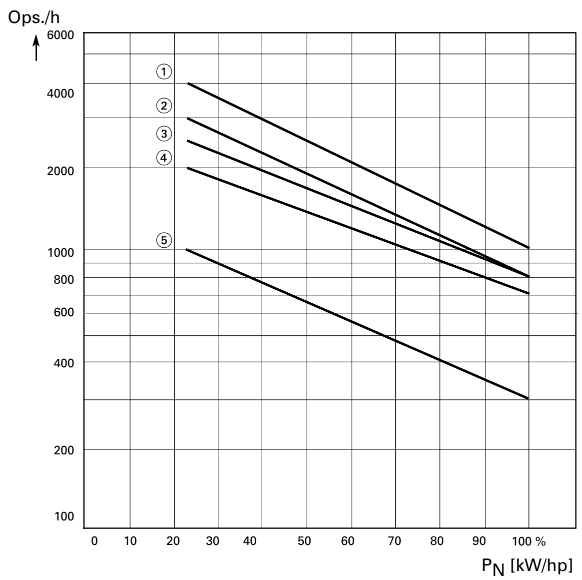


Figure 34-42. Short-Time Loading, 3-pole — XTCE185L – XTCEC20R

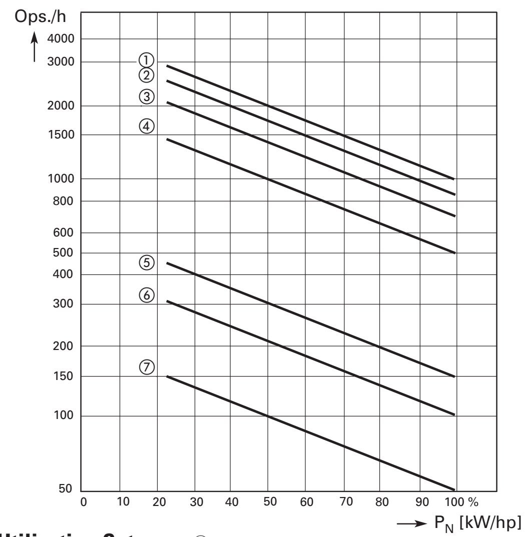


Utilization Category ①

Type	Characteristic Curve Above		
	AC-1	AC-3	AC-2 AC-4
XTCE007B – XTCE015B	3	1	5
XTCE018C – XTCE032C	3	2	5
XTCE040D – XTCE065D	3	2	5
XTCE080F – XTCE150G	3	4	5

① P_N = max. motor rating (kW/hp) of the relevant contactor. ops./h = max. number of operations per hour.

7 to 150 hp



Utilization Category ③

Type	Characteristic Curve Above		
	AC-1	AC-3	AC-4
XTCE185L XTCE225L XTCE250L	2 2 2	1 1 1	6 6 6
XTCE300M XTCE400M XTCE500M	3 3 3	2 2 2	7 7 7
XTCE580N XTCE650N XTCE750N XTCE820N	3 3 3 3	4 4 4 4	5 5 5 5

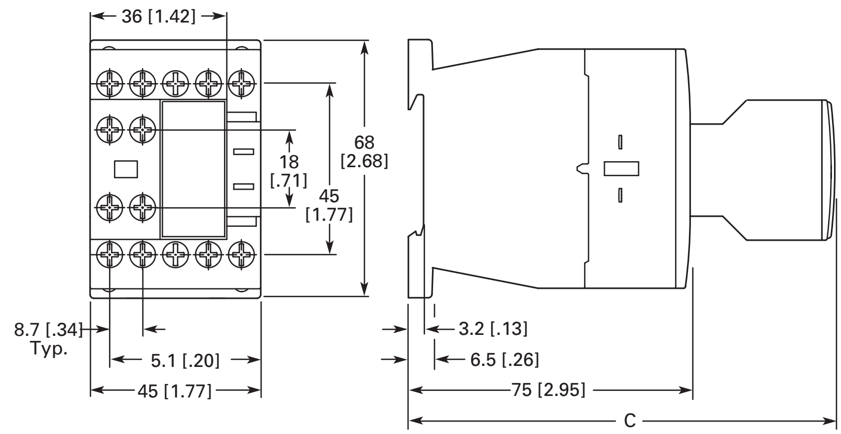
③ P_N = max. motor rating (kW/hp) of the relevant contactor. ops./h = max. number of operations per hour.

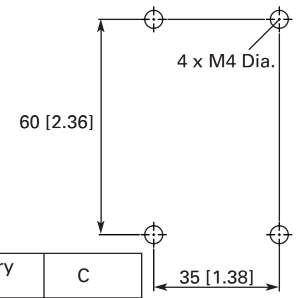
185 to 820 hp

Figure 34-43. Maximum Operating Frequency — Related to Rating and Utilization Category (400V)

Dimensions

XTCE Contactors





Auxiliary Type	C
XTCEXFAC_	117 [4.61]
XTCEXFCC_	117 [4.61]
XTCEXFATC_	125 [4.92]

Figure 34-44. Frame B, XTCE007B – XTCE015B Contactors with Screw Terminals (7 – 15A) — Approximate Dimensions in mm [in]

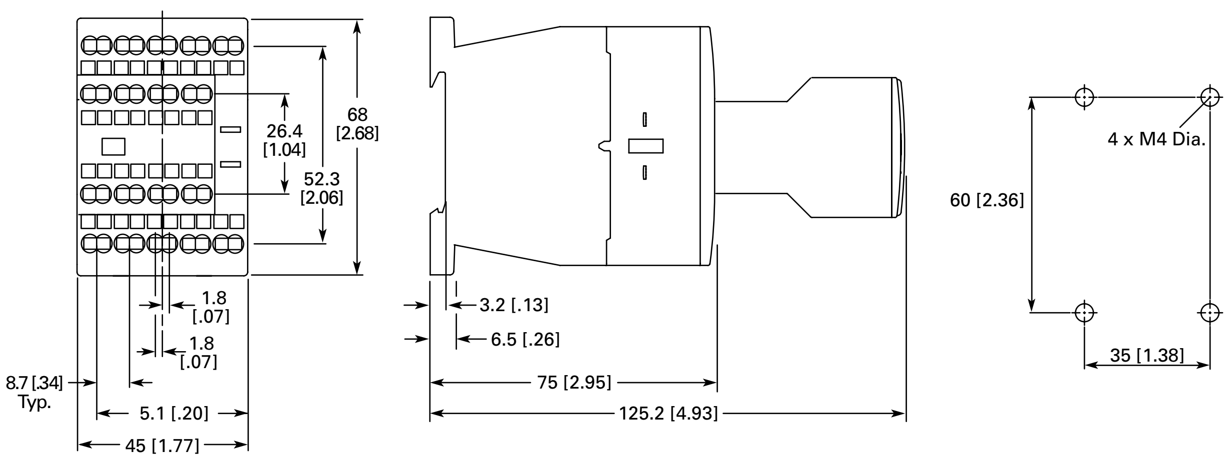
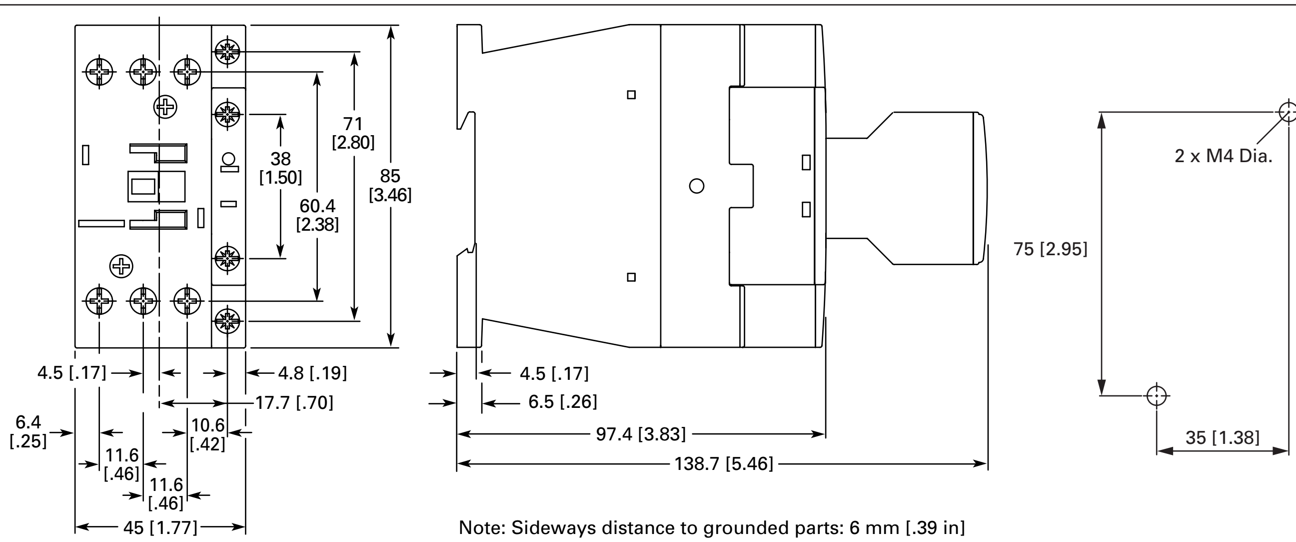


Figure 34-45. Frame B, XTCEC007B – XTCEC012B Contactors with Spring Cage Terminals (7 – 12A) — Approximate Dimensions in mm [in]



Note: Sideways distance to grounded parts: 6 mm [.39 in]

Figure 34-46. Frame C, XTCE018C – XTCE032C Contactors (18 – 32A) — Approximate Dimensions in mm [in]

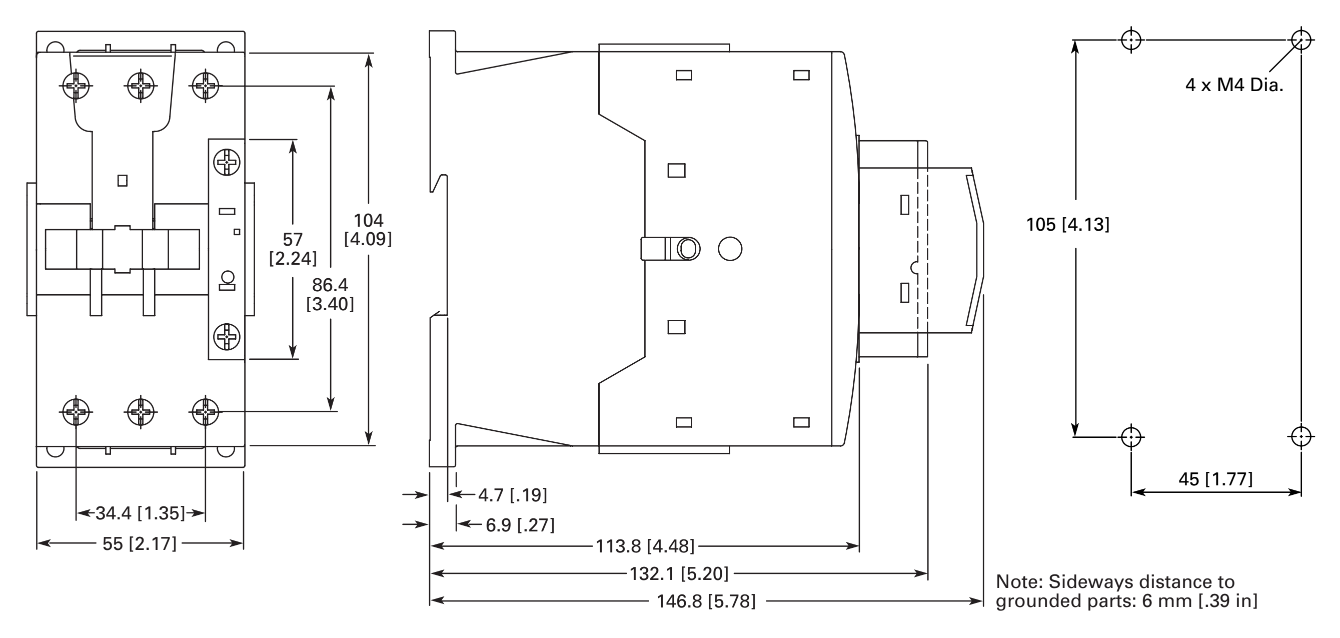


Figure 34-47. Frame D, XTCE040D – XTCE065D Contactors (40 – 65A) — Approximate Dimensions in mm [in]

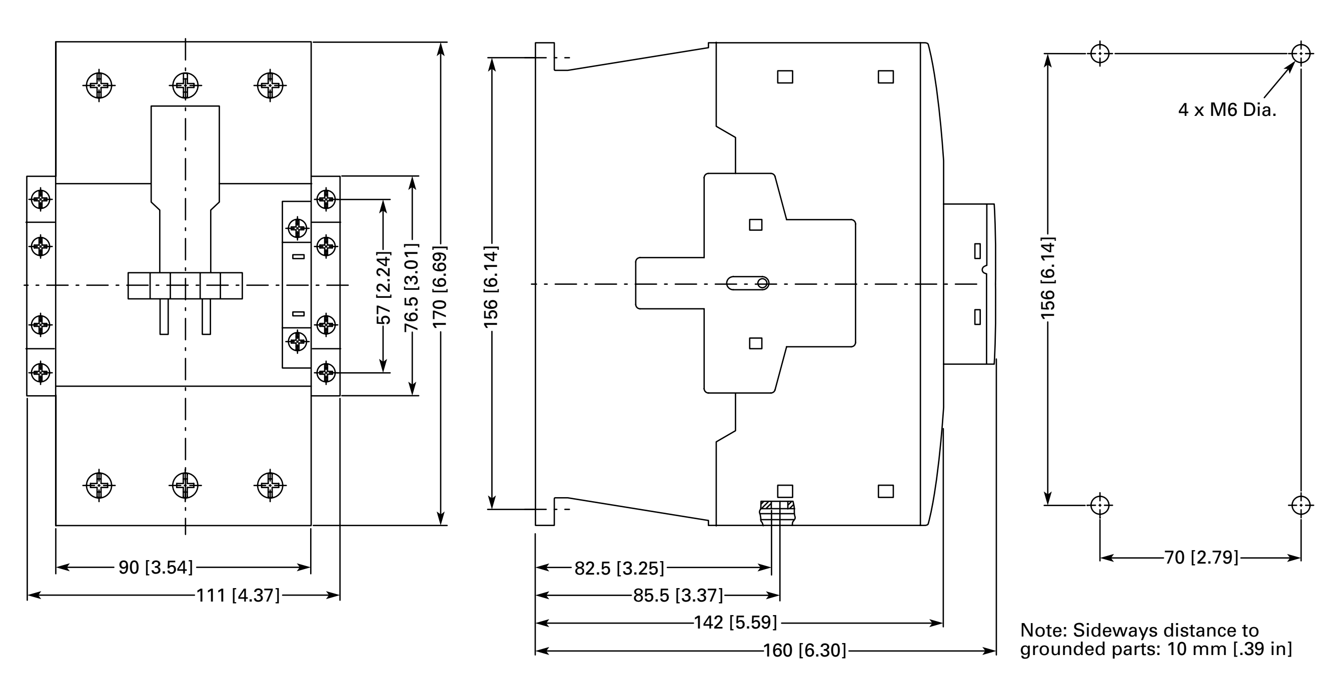
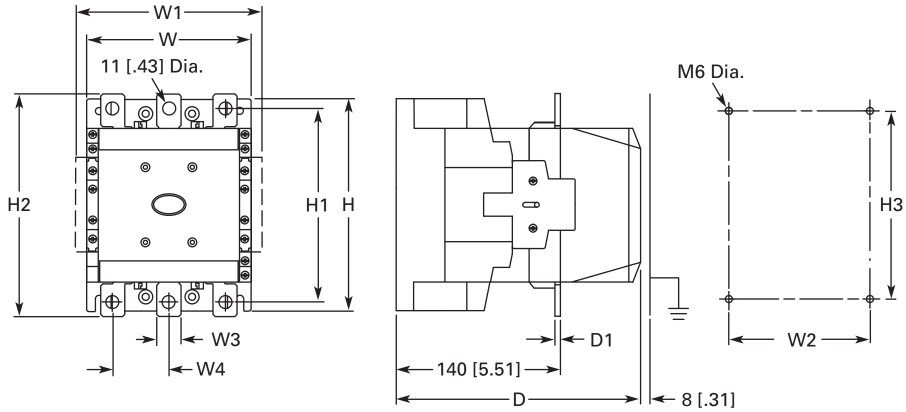


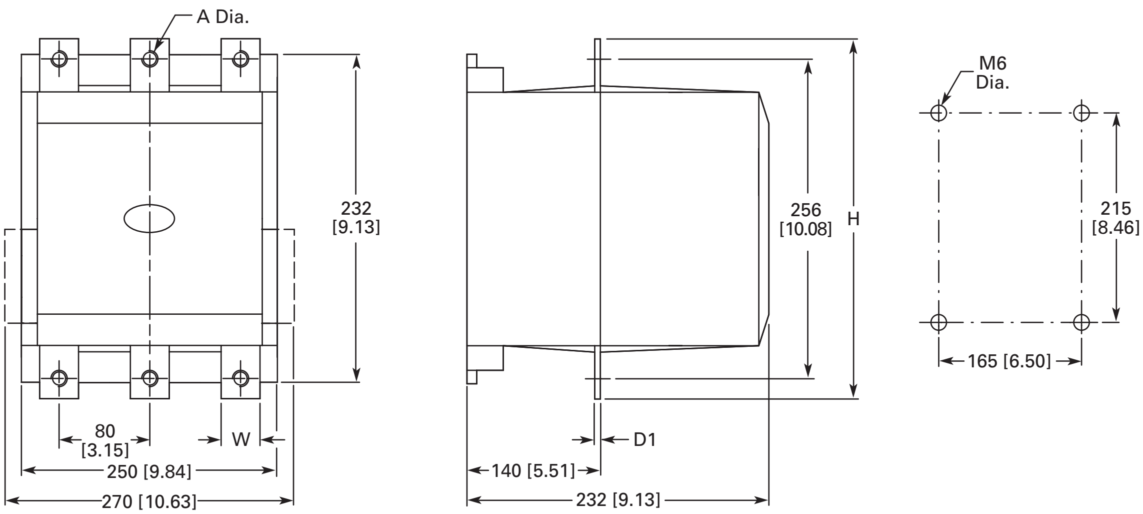
Figure 34-48. Frame F – G, XTCE080F – XTCE150G Contactors (80 – 150A) — Approximate Dimensions in mm [in]

34



	W	W1	W2	W3	W4	H	H1	H2	H3	D	D1
Frame L (185 – 250A)	140 [5.51]	160 [6.30]	120 [4.72]	20 [.79]	48 [1.89]	180 [7.09]	164 [6.46]	189 [7.44]	160 [6.30]	208 [8.19]	5 [.20]
Frame M (300 – 500A)	160 [6.30]	180 [7.09]	130 [5.12]	25 [.98]	48 [1.89]	200 [7.87]	184 [7.24]	209 [8.23]	180 [7.09]	216 [8.50]	6 [.24]

Figure 34-49. Frame L – M, XTCE185L – XTCE500M Contactors (185 – 500A) — Approximate Dimensions in mm [in]



	W	H	D1	A (Dia.)
XTCE580N	35 [1.38]	286 [11.26]	6 [.24]	11 [.43]
XTCE650N	35 [1.38]	286 [11.26]	6 [.24]	11 [.43]
XTCE750N	45 [1.77]	296 [11.65]	6 [.24]	13.5 [.53]
XTCE820N	45 [1.77]	296 [11.65]	6 [.24]	13.5 [.53]
XTCEC10N	45 [1.77]	296 [11.65]	10 [.40]	13.5 [.53]

Figure 34-50. Frame N, XTCE580N – XTCEC10N Contactors (580 – 1000A) — Approximate Dimensions in mm [in]

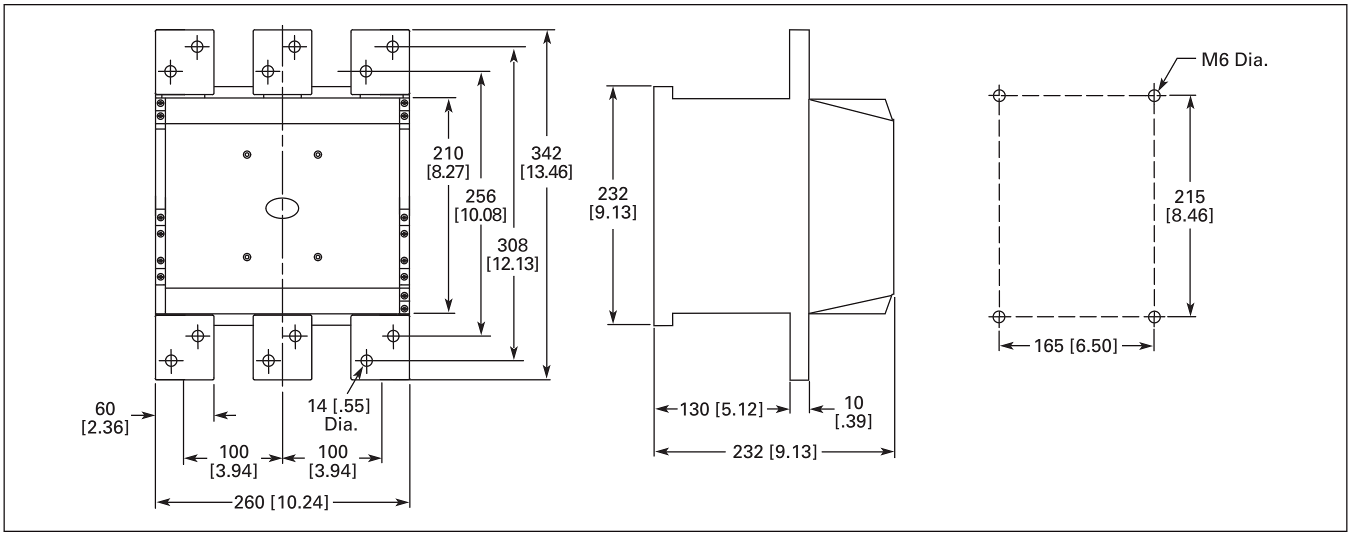


Figure 34-51. Frame P, XTCEC14P Contactor (1400A, AC-1) — Approximate Dimensions in mm [in]

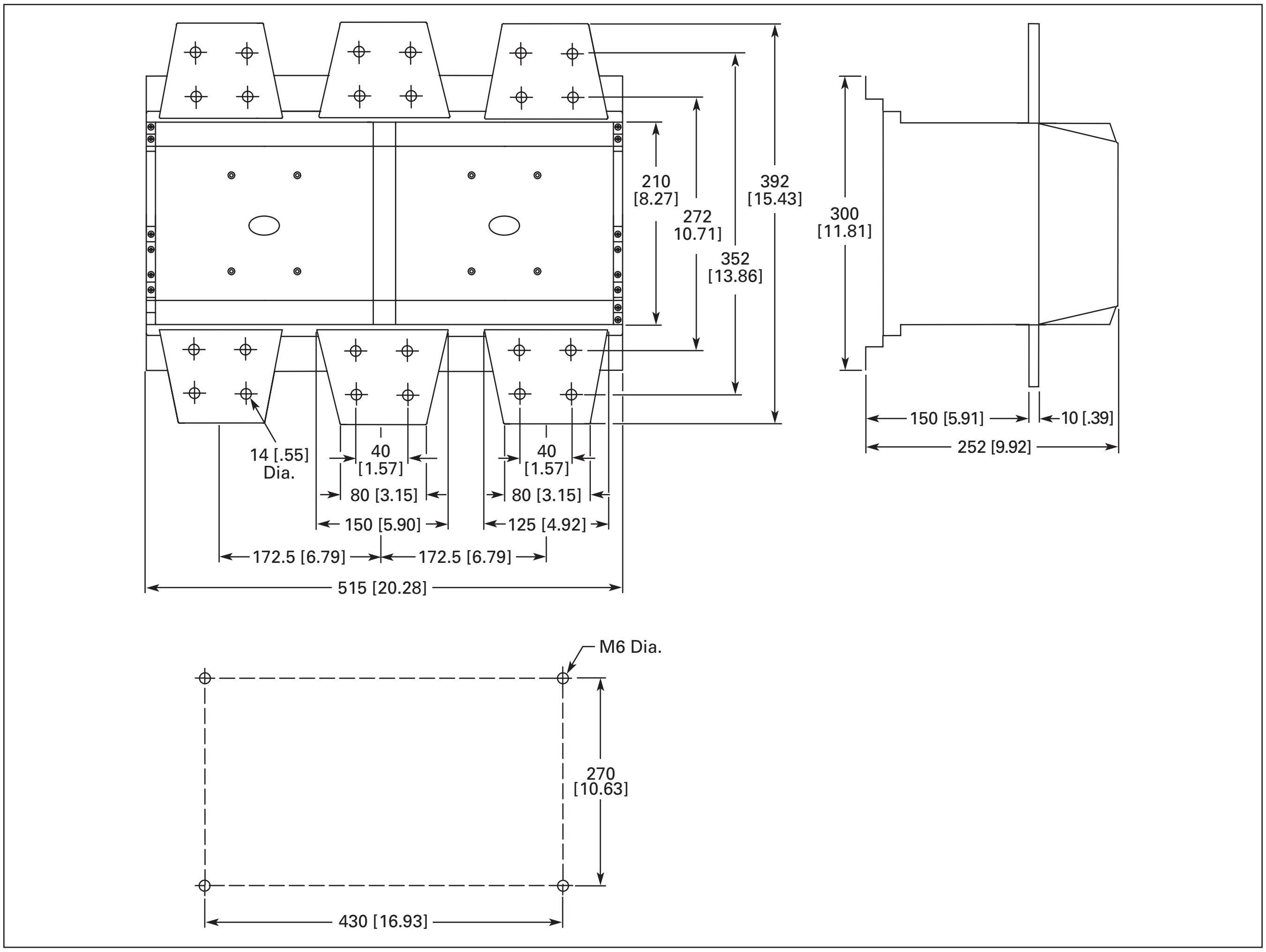


Figure 34-52. Frame R, XTCEC16R, XTCEC20R Contactors — Approximate Dimensions in mm [in]

XTAE Starters with XTOB Overload Relay

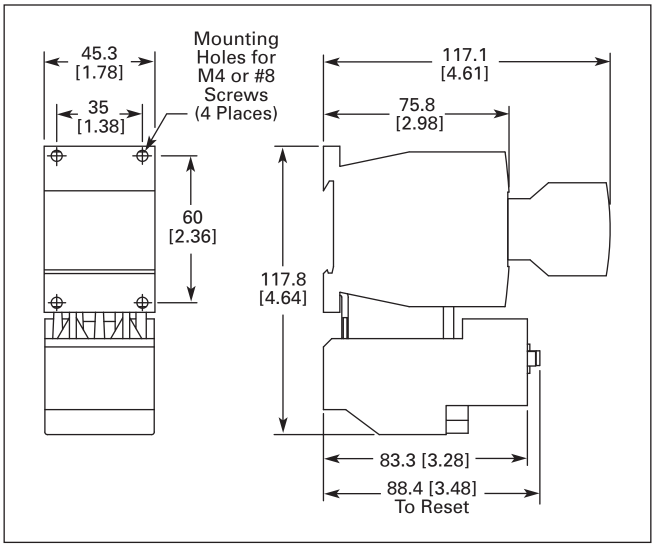


Figure 34-53. Frame B, XTAE007B – XTAE012B Starters with XTOB (7 – 12A) — Approximate Dimensions in mm [in.]

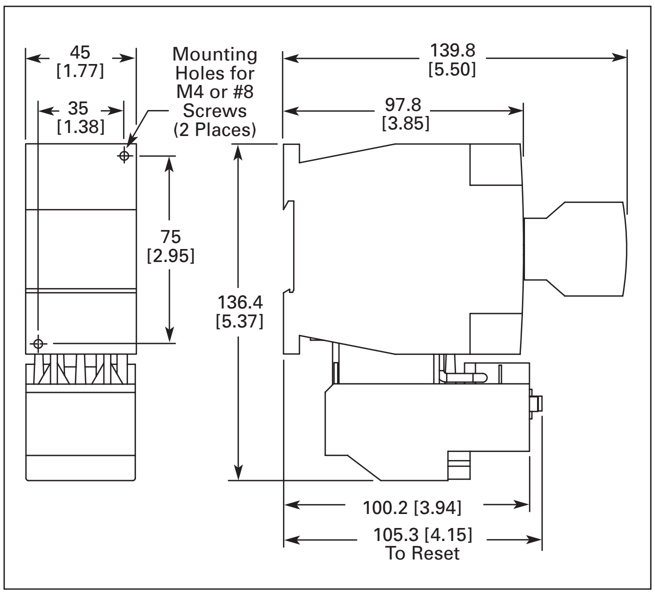


Figure 34-54. Frame C, XTAE018C – XTAE032C Starters with XTOB (18 – 32A) — Approximate Dimensions in mm [in.]

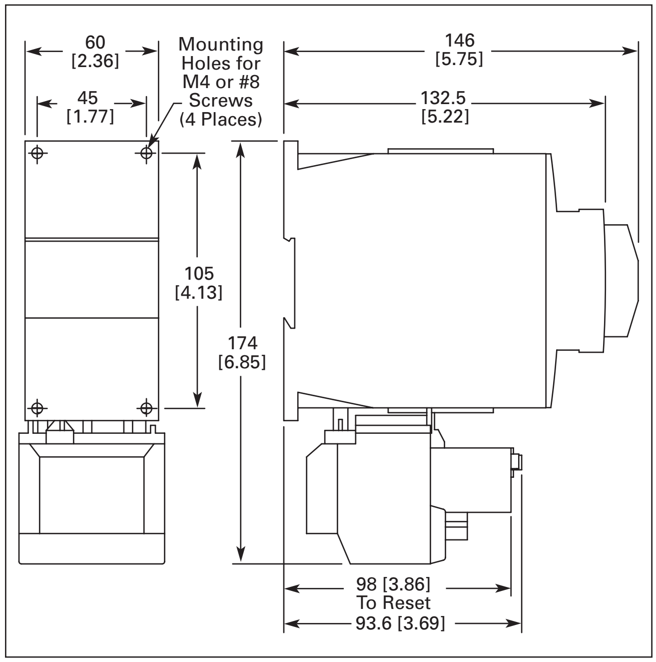


Figure 34-55. Frame D, XTAE040D – XTAE065D Starters with XTOB (40 – 65A) — Approximate Dimensions in mm [in.]

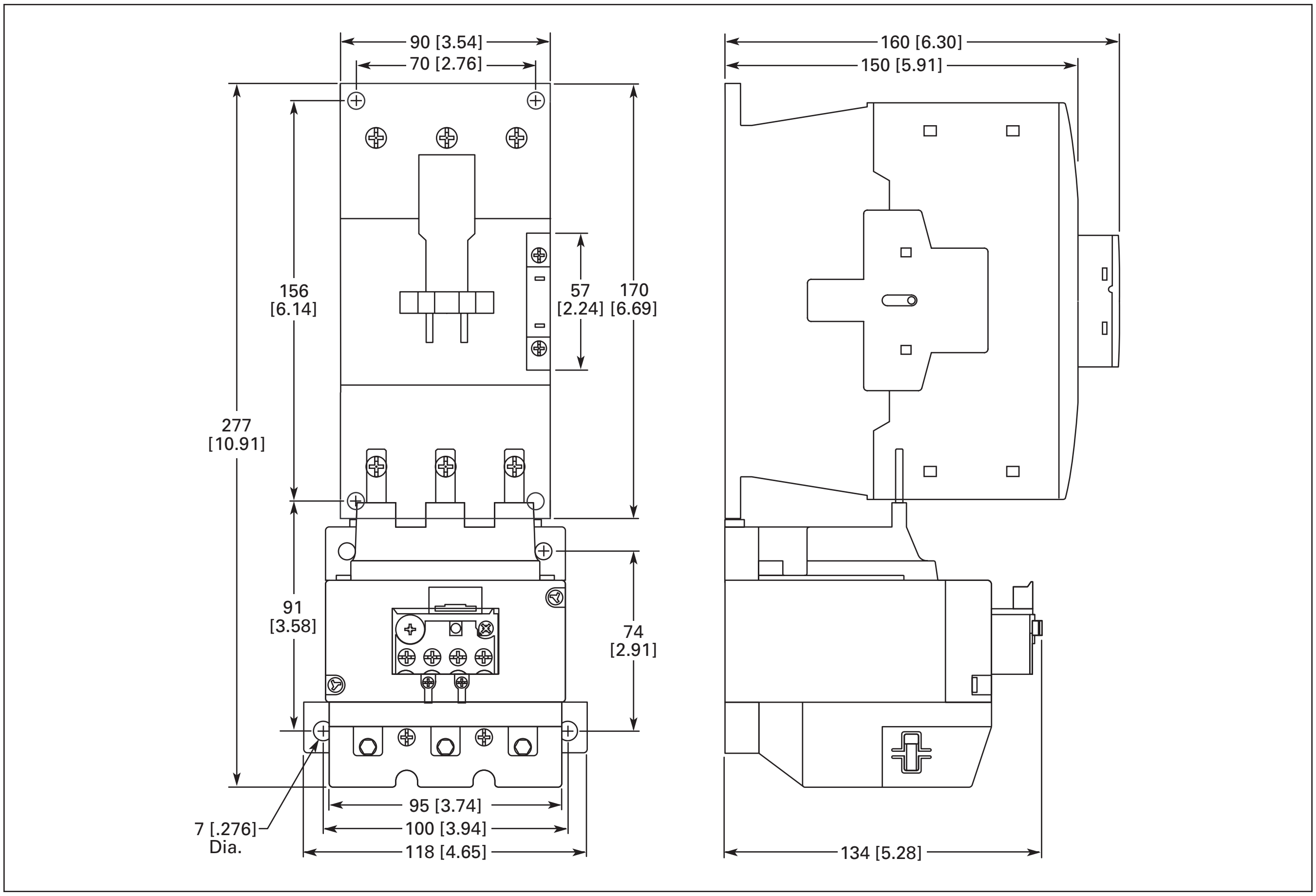


Figure 34-56. Frame F – G, XTAE080F – XTAE150G Starters with XTOB (80 – 150A) — Approximate Dimensions in mm [in.]

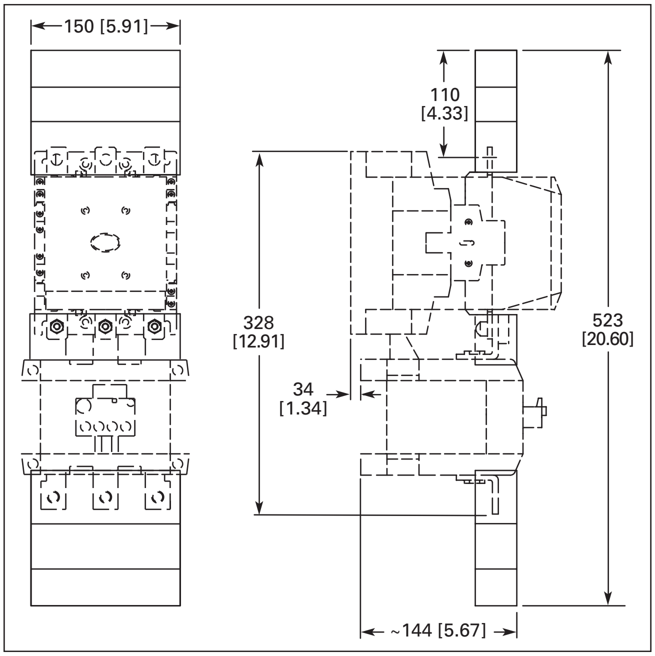


Figure 34-57. Frame L, XTAE185L – XTAE250L Starters with XTOB (185 – 250A) — Approximate Dimensions in mm [in.]

XTAE Starters with C396 Overload Relay

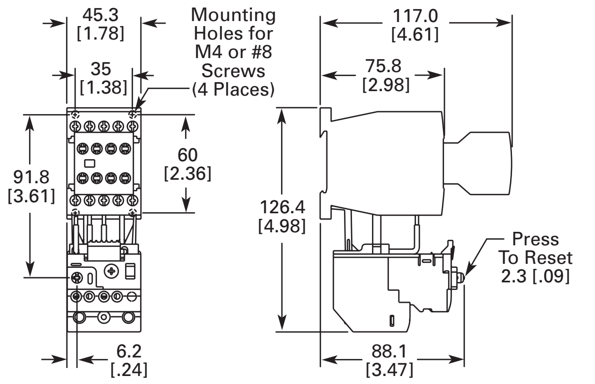


Figure 34-58. Frame B, XTAE007B – XTAE012B Starters with C396 (0.1 – 15A) — Approximate Dimensions in mm [in.]

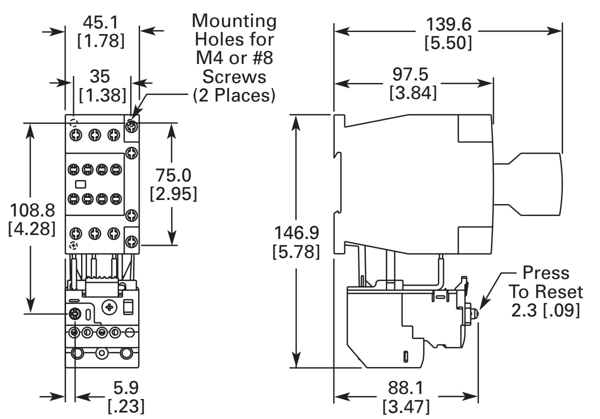


Figure 34-59. Frame C, XTAE018C – XTAE032C Starters with C396 (0.1 – 32A) — Approximate Dimensions in mm [in.]

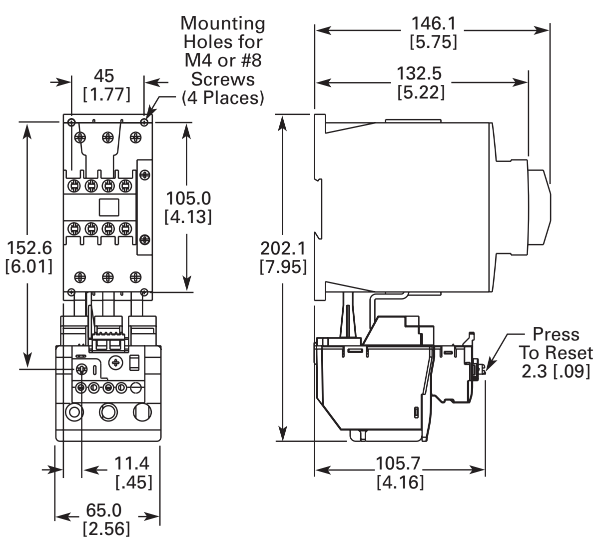


Figure 34-60. Frame D, XTAE040D – XTAE065D Starters with C396 (15 – 75A) — Approximate Dimensions in mm [in.]

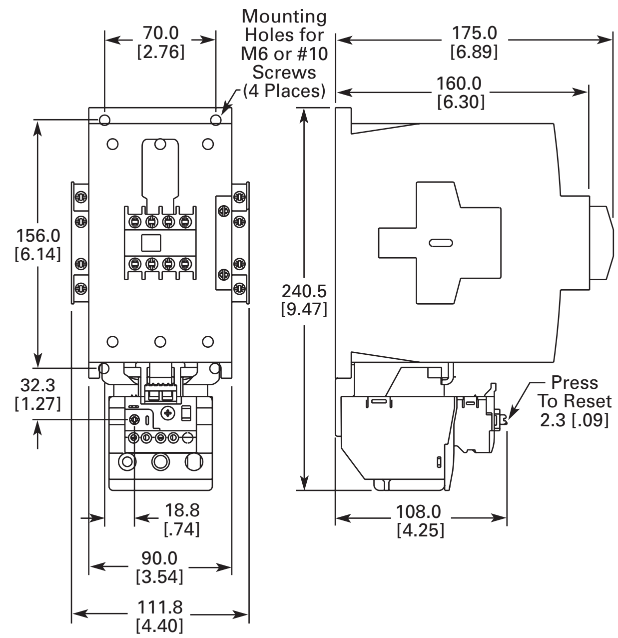


Figure 34-61. Frame F and G, XTAE080F – XTAE115G Starters with C396 (22 – 110A) — Approximate Dimensions in mm [in.]

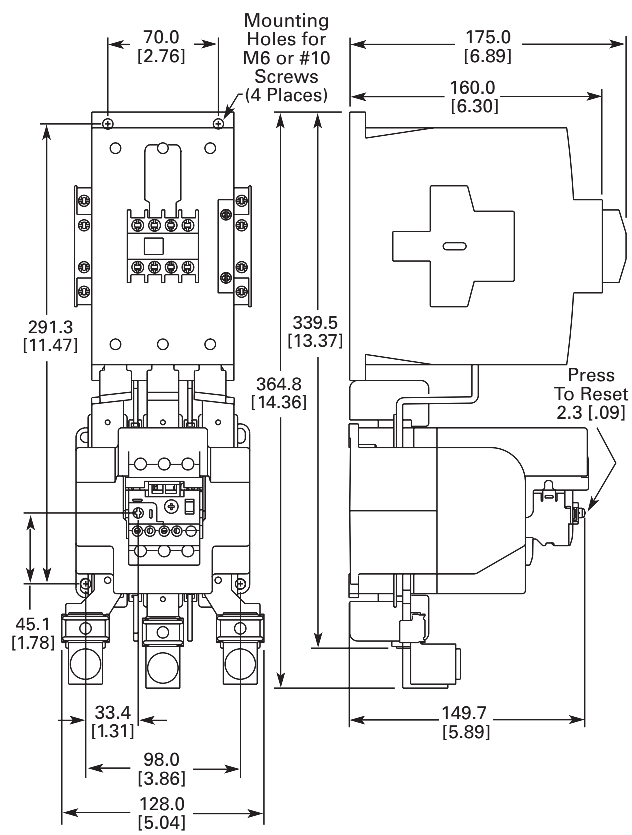
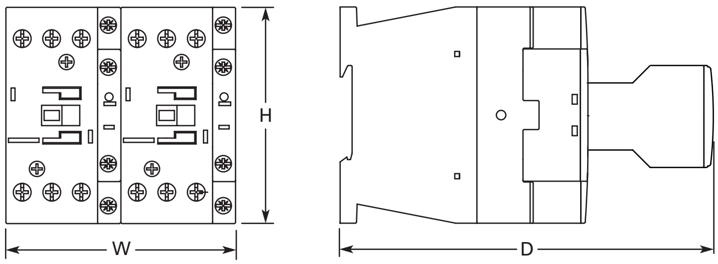


Figure 34-62. Frame G, XTAE115G – XTAE150G Starters with C396 (30 – 150A) — Approximate Dimensions in mm [in.]

Reversing Combination



Frame B (7 – 15A)			Frame C (18 – 32A)			Frame D (40 – 65A)		
W	**H**	**D**	**W**	**H**	**D**	**W**	**H**	**D**
90 [3.54]	68 [2.68]	117 [4.61]	90 [3.54]	85 [3.34]	138 [5.43]	110 [4.33]	115 [4.53]	146.8 [5.78]

Figure 34-63. XTCR Reversing Combination Frame B – D — Approximate Dimensions in mm [in]

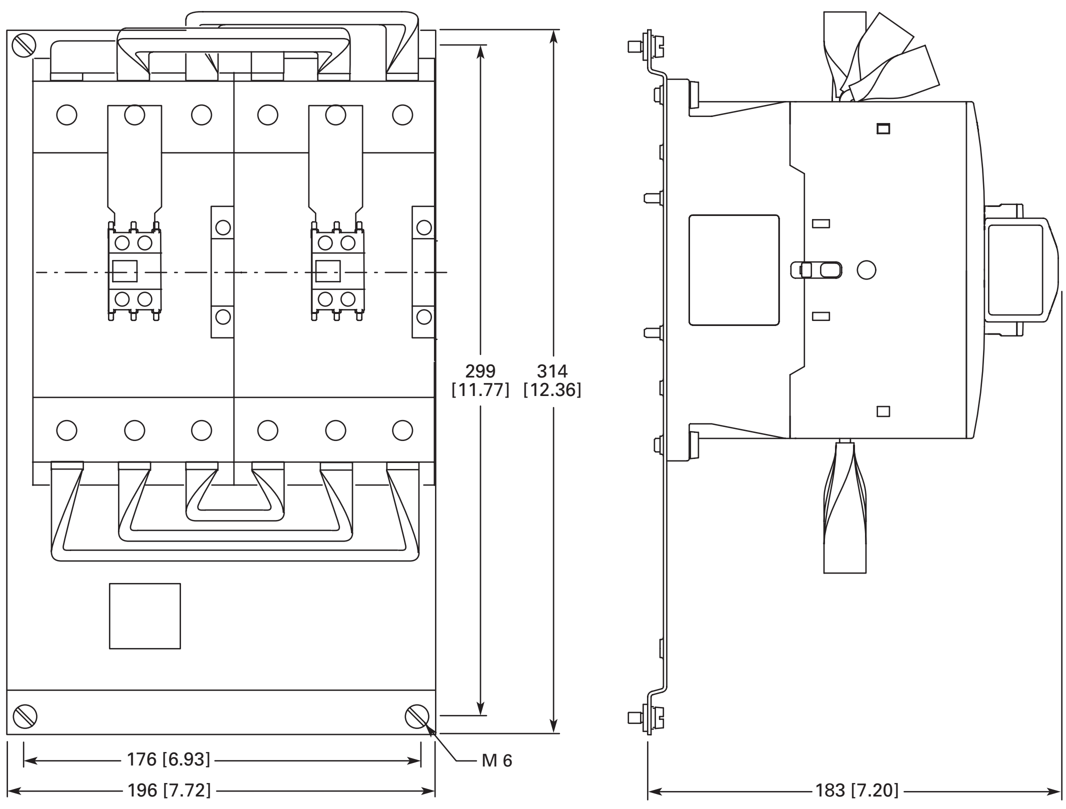
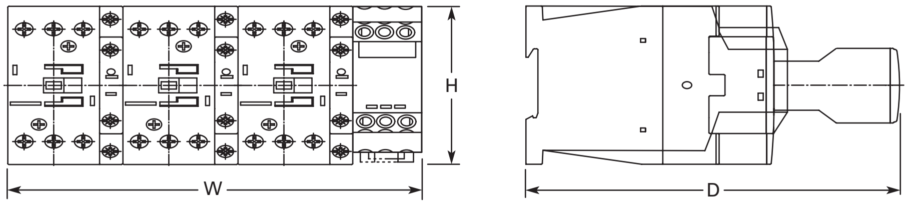


Figure 34-64. XTCR Reversing Combination Frame F – G — Approximate Dimensions in mm [in]

34

Star-Delta Combination



Frame B			Frame C			Frame D		
W	H	D	W	H	D	W	H	D
158 [6.22]	68 [2.68]	117 [4.61]	158 [6.22]	85 [3.34]	138 [5.43]	188 [7.40]	115 [4.53]	146.8 [5.78]

Figure 34-65. Star-Delta Combination Frame B – D — Approximate Dimensions in mm [in]

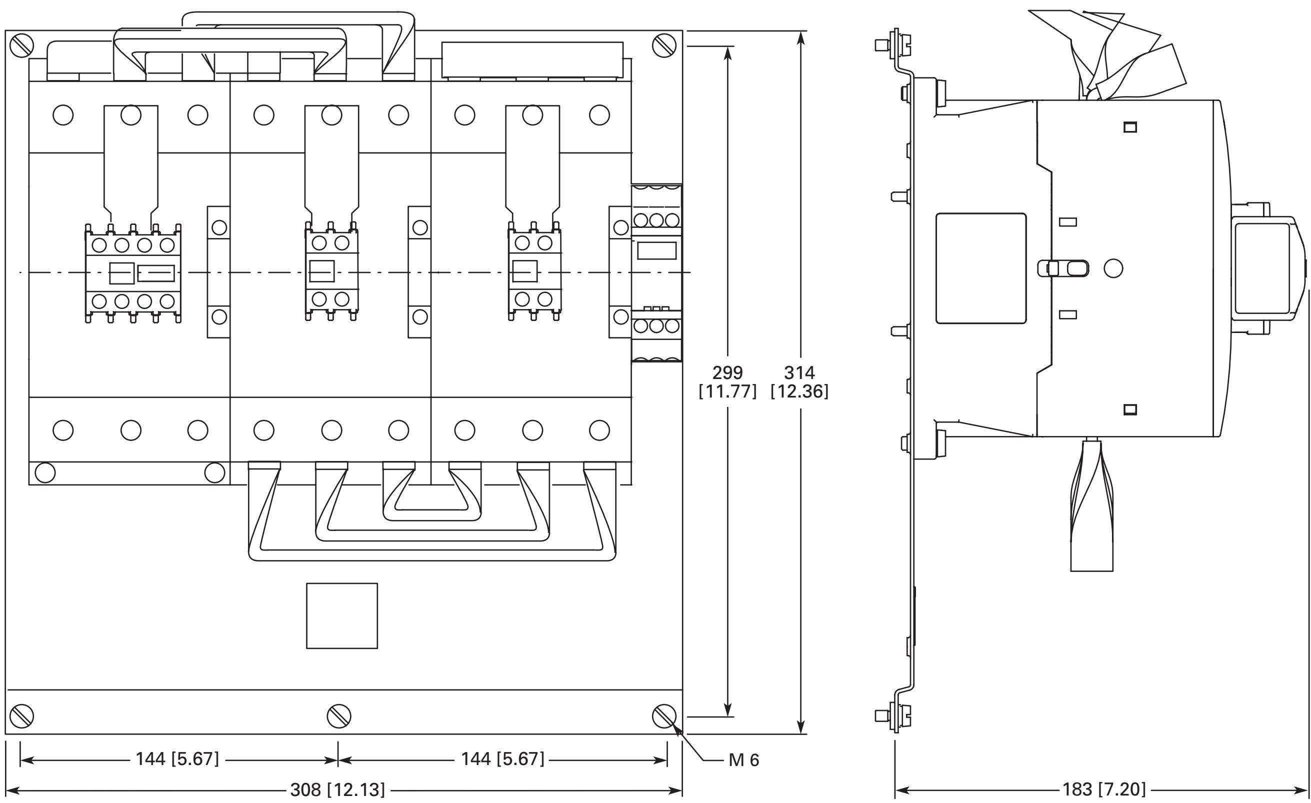


Figure 34-66. Star-Delta Combination Frame F – G — Approximate Dimensions in mm [in]

Mechanical Interlock

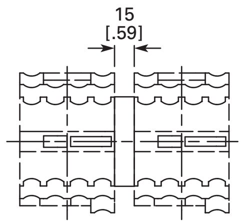


Figure 34-67. Frame L – M. XTCEXMLM Mechanical Interlock — Approximate Dimensions in mm [in]

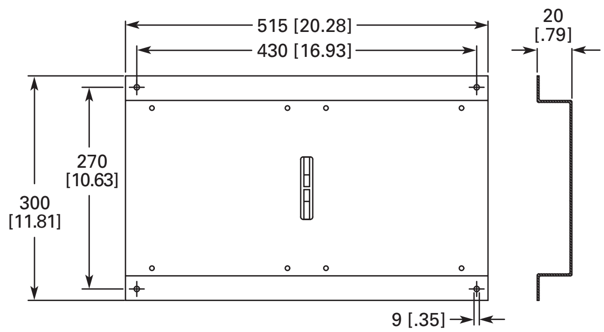
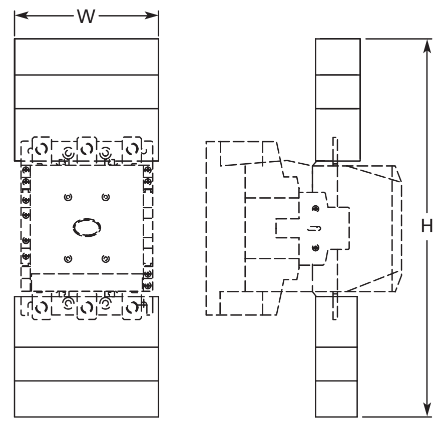


Figure 34-68. XTCEXMLN — Approximate Dimensions in mm [in]

Contactor with Terminal Shroud

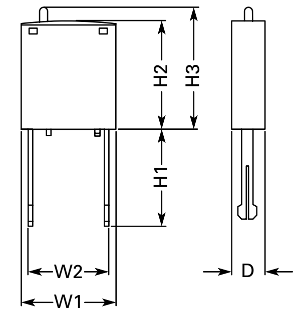


XTCE185L, XTCE225L, XTCE250L		XTCE300M, XTCE400M		XTCE500M		XTCE580N, XTCE650N, XTCE750N, XTCE820N, XTCEC10N	
W	H	W	H	W	H	W	H
150 [5.91]	384 [15.12]	150 [5.91]	404 [15.91]	174 [6.85]	426 [16.77]	236 [9.29]	506 [19.92]

Figure 34-69. Frame L – N Contactors, XTCE185L – XTCEC10N, with Terminal Shroud XTLEXTS — Approximate Dimensions in mm [in]

34

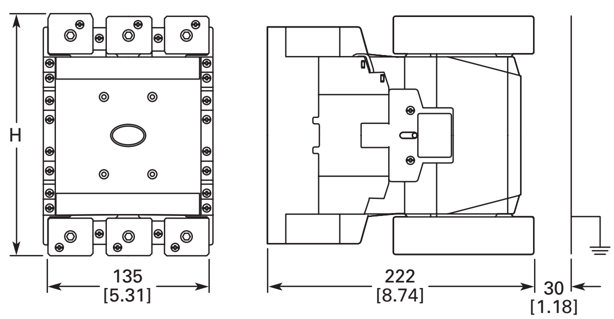
Suppressor



	W1	W2	H1	H2	H3	D
XTCEXRSB... XTCEXVSB... XTCEXVSLB... XTCEXDSB...	25 [.98]	9.2 [.36]	25.9 [1.02]	28 [1.10]	32 [1.26]	9 [.35]
XTCEXRSC... XTCEXVSC... XTCEXVSLC...	25 [.98]	9.2 [.36]	16 [.63]	28 [1.10]	32 [1.26]	9 [.35]
XTCEXRSF... XTCEXVSF... XTCEXVSLF...	25 [.98]	20 [.79]	18.5 [.73]	28 [1.10]	32 [1.26]	9 [.35]

Figure 34-70. Suppressor — Approximate Dimensions in mm [in]

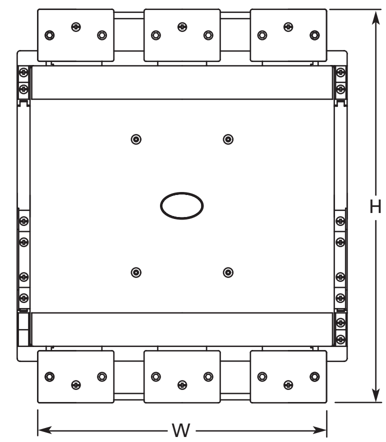
Cable Terminal Block



	H
XTCE185L – XTCE250L	198 [7.80]
XTCE300M – XTCE400M	218 [8.58]

Figure 34-71. XTCEXTLA — Approximate Dimensions in mm [in]

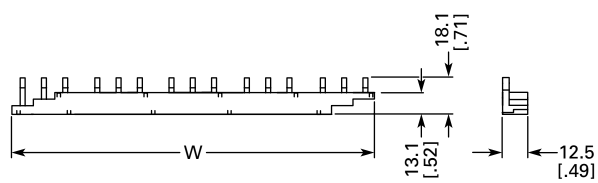
Flat Strip Conductor Terminals



	W	H
XTCE500M	171 [6.73]	232 [9.13]
XTCE580N – XTCE650N	218 [8.58]	295 [11.61]
XTCE750N – XTCE820N	231 [9.09]	310 [12.20]

Figure 34-72. XTCEXTFB — Approximate Dimensions in mm [in]

Three-Phase Commoning Link



	W
XTCEXCLK3B	112 [4.41]
XTCEXCLK4B	157 [6.18]
XTCBXCLK5B	202 [7.95]

Figure 34-73. Frame B Three-Phase Commoning Link — Approximate Dimensions in mm [in]

Contents



XTOB Overload Relay



XTOT Overload Relay

Catalog Number Selection

Table 34-124. *XT* IEC Overload Relays — Catalog Numbering System

XT OB P16 B C1 S

Designation	
XT =	***XT*** Line of IEC Control

Type	
OB =	Bimetallic Overload Relay
OT =	Current Transformer Overload Relay

Overload Release

Frame B	
P16 =	0.1 – 0.16A
P24 =	0.16 – 0.24A
P40 =	0.24 – 0.4A
P60 =	0.4 – 0.6A
001 =	0.6 – 1A
1P6 =	1.0 – 1.6A
2P4 =	1.6 – 2.4A
004 =	2.4 – 4A
006 =	4 – 6A
010 =	6 – 10A
012 =	9 – 12A
016 =	12 – 16A

Frame C	
P16 =	0.1 – 0.16A
P24 =	0.16 – 0.24A
P40 =	0.24 – 0.4A
P60 =	0.4 – 0.6A
001 =	0.6 – 1A
1P6 =	1.0 – 1.6A
2P4 =	1.6 – 2.4A
004 =	2.4 – 4A
006 =	4 – 6A
010 =	6 – 10A
016 =	10 – 16A
024 =	16 – 24A
032 =	24 – 32A

Frame D	
010 =	6 – 10A
016 =	10 – 16A
024 =	16 – 24A
040 =	24 – 40A
057 =	40 – 57A
065 =	50 – 65A

Frame F	
035 =	25 – 35A
050 =	35 – 50A
070 =	50 – 70A
100 =	70 – 100A

Frame G	
035 =	25 – 35A
050 =	35 – 50A
070 =	50 – 70A
100 =	70 – 100A
125 =	95 – 125A
150 =	120 – 150A

Frame L	
070 =	50 – 70A
100 =	70 – 100A
125 =	95 – 125A
160 =	120 – 160A
220 =	160 – 220A
250 =	200 – 250A

Frame M	
063 =	42 – 63A
090 =	60 – 90A
125 =	85 – 125A
160 =	110 – 160A
240 =	160 – 240A
290 =	190 – 290A
400 =	270 – 400A
540 =	360 – 540A

Frame N	
063 =	42 – 63A
090 =	60 – 90A
125 =	85 – 125A
160 =	110 – 160A
240 =	160 – 240A
290 =	190 – 290A
400 =	270 – 400A
540 =	360 – 540A
630 =	420 – 630A

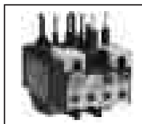
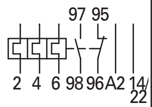
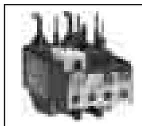
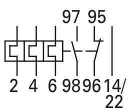
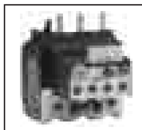
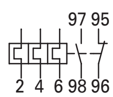
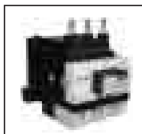
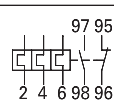
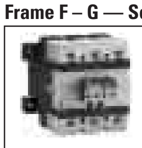
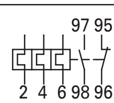
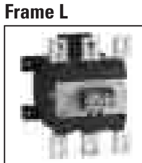
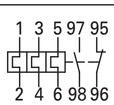
Frame Size Designation	
B =	45 mm
C =	45 mm
D =	55 mm
G =	90 mm
L =	140 mm
BLANK =	XTOT Only

Trip Class	
C1 =	Class 10A
C3 =	Class 30

Mounting	
BLANK =	Direct to Contactor
S =	Separate Mount

Product Selection

Table 34-125. Overload Relay

	Overload Releases, I_r	Contact Sequence	Contact Configu-ration	For Use with Contactor Amp Range	Short-Circuit Protection (A) Fuse Type 1 Coordi-nation, gG/gL	Fuse Type 2 Coordi-nation, gG/gL	Maximum Circuit Breaker	CEC/NEC Fuse	Catalog Number	Price U.S. $
Frame B — Direct Mount										
	0.1 – 0.16		1NO-1NC	7 – 15A	25	0.5	25	3	**XTOBP16BC1**	
	0.16 – 0.24		1NO-1NC	7 – 15A	25	1	25	3	**XTOBP24BC1**	
	0.24 – 0.4		1NO-1NC	7 – 15A	25	2	25	3	**XTOBP40BC1**	
	0.4 – 0.6		1NO-1NC	7 – 15A	25	4	25	3	**XTOBP60BC1**	
	0.6 – 1		1NO-1NC	7 – 15A	25	4	25	3	**XTOB001BC1**	
	1 – 1.6		1NO-1NC	7 – 15A	25	6	25	6	**XTOB1P6BC1**	
	1.6 – 2.4		1NO-1NC	7 – 15A	25	10	25	6	**XTOB2P4BC1**	
	2.4 – 4		1NO-1NC	7 – 15A	25	16	25	15	**XTOB004BC1**	
	4 – 6		1NO-1NC	7 – 15A	25	20	25	20	**XTOB006BC1**	
	6 – 10		1NO-1NC	7 – 15A	50	25	25	35	**XTOB010BC1**	
	9 – 12		1NO-1NC	9 – 15A	50	25	25	45	**XTOB012BC1**	
	12 – 16		1NO-1NC	12 – 15A	50	25	30	45	**XTOB016BC1**	
Frame C — Direct Mount										
	0.1 – 0.16		1NO-1NC	18 – 32A	25	0.5	25	3	**XTOBP16CC1**	
	0.16 – 0.24		1NO-1NC	18 – 32A	25	1	25	3	**XTOBP24CC1**	
	0.24 – 0.4		1NO-1NC	18 – 32A	25	2	25	3	**XTOBP40CC1**	
	0.4 – 0.6		1NO-1NC	18 – 32A	25	4	25	3	**XTOBP60CC1**	
	0.6 – 1		1NO-1NC	18 – 32A	25	4	25	3	**XTOB001CC1**	
	1 – 1.6		1NO-1NC	18 – 32A	25	6	25	6	**XTOB1P6CC1**	
	1.6 – 2.4		1NO-1NC	18 – 32A	25	10	25	6	**XTOB2P4CC1**	
	2.4 – 4		1NO-1NC	18 – 32A	25	16	25	15	**XTOB004CC1**	
	4 – 6		1NO-1NC	18 – 32A	25	20	25	20	**XTOB006CC1**	
	6 – 10		1NO-1NC	18 – 32A	50	25	25	25	**XTOB010CC1**	
	10 – 16		1NO-1NC	18 – 32A	63	35	30	25	**XTOB016CC1**	
	16 – 24		1NO-1NC	18 – 32A	100	35	30	25	**XTOB024CC1**	
	24 – 32		1NO-1NC	25 – 32A	125	63	30	25	**XTOB032CC1**	
Frame D — Direct Mount										
	6 – 10		1NO-1NC	40 – 65A	50	25	25	25	**XTOB010DC1**	
	10 – 16		1NO-1NC	40 – 65A	63	35	25	25	**XTOB016DC1**	
	16 – 24		1NO-1NC	40 – 65A	63	50	30	25	**XTOB024DC1**	
	24 – 40		1NO-1NC	40 – 65A	125	63	125	125	**XTOB040DC1**	
	40 – 57		1NO-1NC	50 – 65A	160	80	150	150	**XTOB057DC1**	
	50 – 65		1NO-1NC	65A	160	100	150	200	**XTOB065DC1**	
Frame F – G — Direct Mount										
	25 – 35		1NO-1NC	80 – 150A	125	100	125	125	**XTOB035GC1**	
	35 – 50		1NO-1NC	80 – 150A	160	125	150	200	**XTOB050GC1**	
	50 – 70		1NO-1NC	80 – 150A	250	160	150	200	**XTOB070GC1**	
	70 – 100		1NO-1NC	80 – 150A	315	200	400	400	**XTOB100GC1**	
	95 – 125		1NO-1NC	80 – 150A	315	250	500	400	**XTOB125GC1**	
	120 – 150		1NO-1NC	80 – 150A	315	250	600	600	**XTOB150GC1**	
Frame F – G — Separate Mount										
	25 – 35		1NO-1NC	80 – 150A	125	100	125	125	**XTOB035GC1S**	
	35 – 50		1NO-1NC	80 – 150A	160	125	150	200	**XTOB050GC1S**	
	50 – 70		1NO-1NC	80 – 150A	250	160	150	200	**XTOB070GC1S**	
	70 – 100		1NO-1NC	80 – 150A	315	200	400	400	**XTOB100GC1S**	
	95 – 125		1NO-1NC	80 – 150A	315	250	500	400	**XTOB125GC1S**	
	120 – 150		1NO-1NC	80 – 150A	315	250	600	600	**XTOB150GC1S**	
Frame L										
	50 – 70		1NO-1NC	185 – 250A	250	160	150	200	**XTOB070LC1**	
	70 – 100		1NO-1NC	185 – 250A	315	200	400	400	**XTOB100LC1**	
	95 – 125		1NO-1NC	185 – 250A	315	250	500	400	**XTOB125LC1**	
	120 – 160		1NO-1NC	185 – 250A	400	250	600	600	**XTOB160LC1**	
	160 – 220		1NO-1NC	185 – 250A	400 ①	315 ①	800	800	**XTOB220LC1**	
	200 – 250		1NO-1NC	225 – 250A	400 ①	315 ①	600	700	**XTOB250LC1**	

① For separate mounting, short circuit Type 1 rating is 500A and short circuit Type 2 rating is 400A.

Notes:

Short circuit protection: Observe the maximum permissible fuse of the contactor with direct device mounting. See MN03402001E for more information on overload relays for Frame B – G.

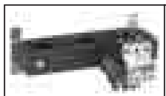
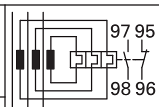
Trip Class: 10A

Suitable for protection of EEx e-motors. EC prototype test certificate available upon request.

Observe manuals MN03402001E and MN03407001E, see **Table 34-129**.

Technical Data .... **Page 34-99**
Dimensions .... **Page 34-101**
Discount Symbol **1CD7**

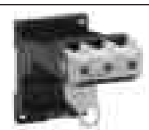
Table 34-126. Current Transformer Operated Overload Relays ①

	Overload Releases, I_r	Contact Sequence	Contact Configu-ration	For Use with Contactor Amp Range	Short-Circuit Protection (A)				Catalog Number	Price U.S. $
					Type 1 Coordi-nation, gG/gL	Type 2 Coordi-nation, gG/gL	Circuit Breaker	CEC/NEC Fuse		
Frame M – N — Separate Mount										
	42 – 63		1NO-1NC	300 – 500A	—	—	150	200	**XTOT063C3S**	
	60 – 90		1NO-1NC	300 – 500A	—	—	250	250	**XTOT090C3S**	
	85 – 125		1NO-1NC	300 – 500A	—	—	500	400	**XTOT125C3S**	
	110 – 160		1NO-1NC	300 – 500A	—	—	600	600	**XTOT160C3S**	
	160 – 240		1NO-1NC	300 – 500A	—	—	600	700	**XTOT240C3S**	
	190 – 290		1NO-1NC	300 – 500A	—	—	600	700	**XTOT290C3S**	
	270 – 400		1NO1-NC	300 – 500A	—	—	1000	1000	**XTOT400C3S**	
	360 – 540		1NO-1NC	500A	—	—	600	1000	**XTOT540C3S**	
	420 – 630		1NO-1NC	630A	—	—	600	1000	**XTOT630C3S**	

① The main current parameters are defined by the main current wiring which is used.

Accessories

Table 34-127. DIN Rail or Panel Mount Adapter, Frame C – D ②

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $
	XTOB…CC1	5	**XTOBXDINC**	
	XTOB…DC1	1	**XTOBXDIND**	

② Can be snap fitted on a top hat rail (DIN rail) to IEC/EN 60715 or can be screw fitted.

Table 34-128. Terminal Shroud

	For Use with…	Catalog Number	Price U.S. $
	XTOB…LC1	**XTOBXTSL**	

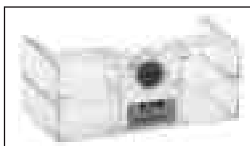
	For direct mounting of …	Catalog Number	Price U.S. $
	XTOB…LC1 to XTCE185L, XTCE225L or XTCE250L	**XTOBXTSCL**	

Table 34-129. Documentation — Manuals for Overload Monitoring of EEX e-motors

Publication Number	For Use with…
MN03402001E	XTOB…BC1 XTOB…CC1
MN03407001E	XTOB…DC1 XTOB…GC1

Dimensions .... **Page 34-101**
Discount Symbol **1CD7**

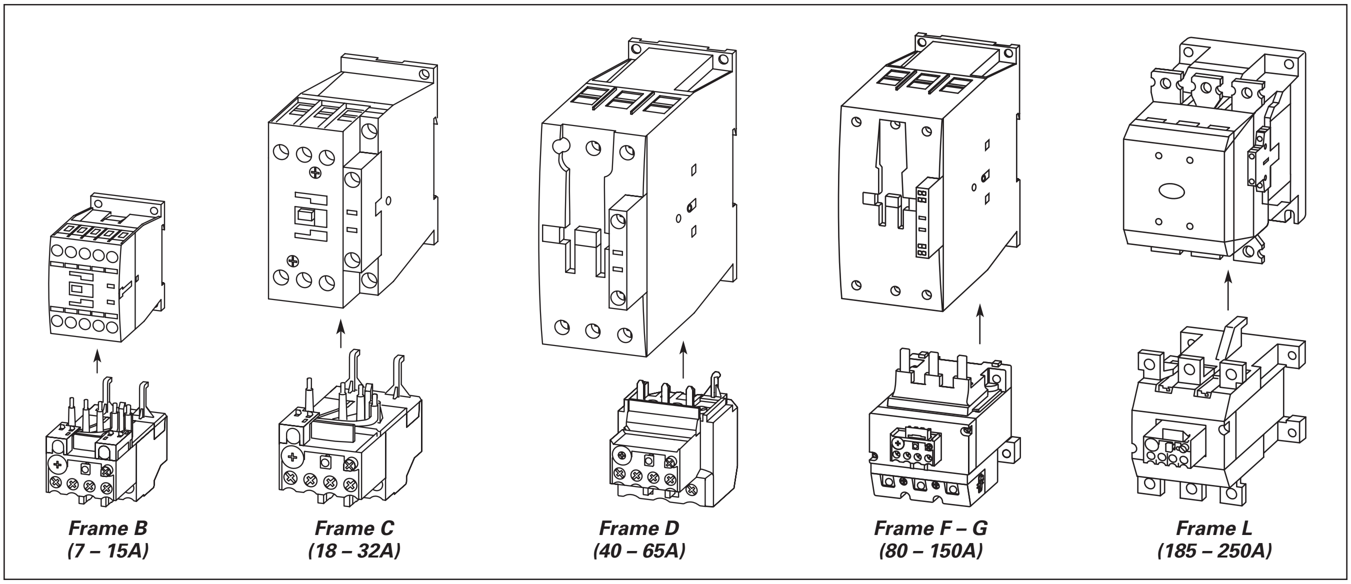


Figure 34-74. Overload Fitted Directly to the Contactor

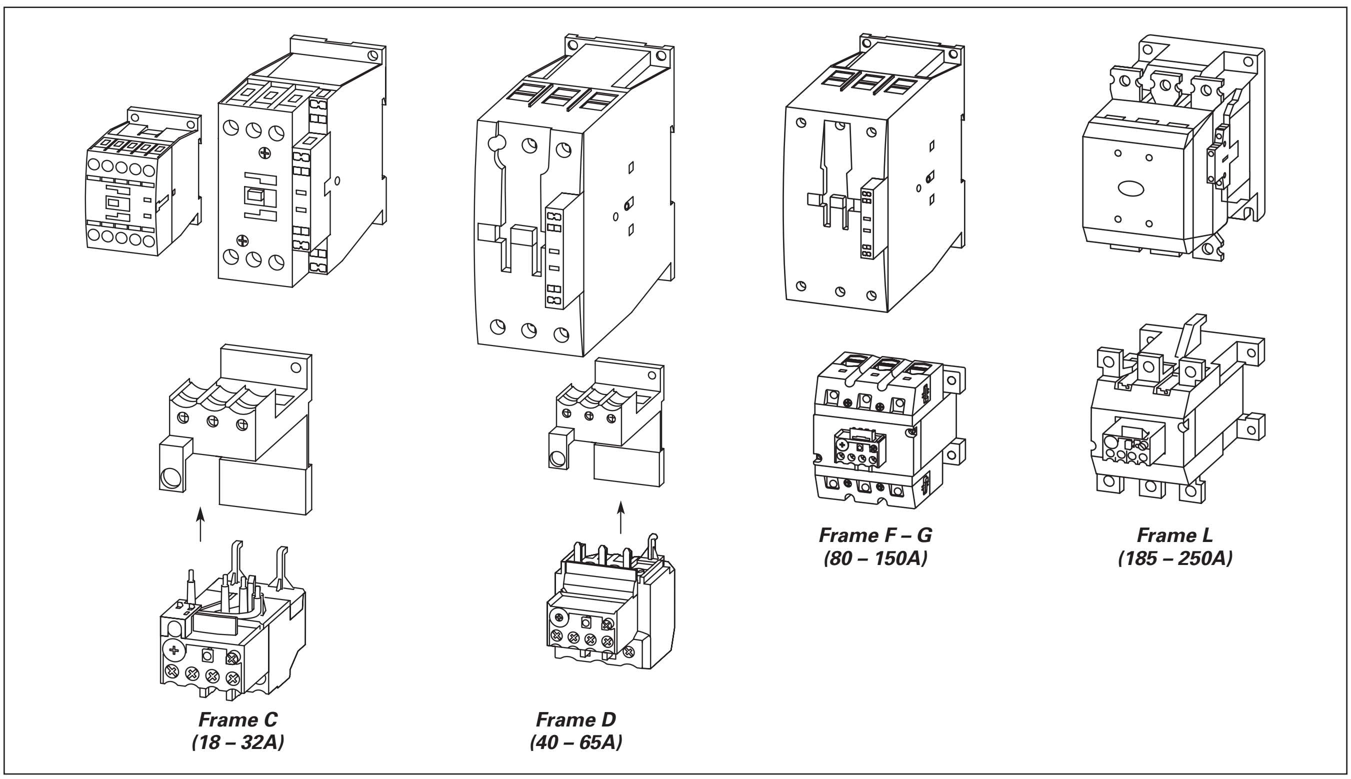


Figure 34-75. Overload Mounted Separately from the Contactor

34

Technical Data and Specifications

Table 34-130. XTOB Overload Relay — Technical Data and Specifications

Description	XTOB…BC1, XTOB…CC1	XTOB…DC1	XTOB…GC1, XTOB…GC1S	XTOB...LC1
General				
Standards	IEC/EN 60947, VDE 0660, UL, CSA			
Climate Proofing	Damp heat, constant, to IEC 60068-2-78; Damp heat, cyclic, to IEC 60068- 2-30			
Ambient Temperature ①	-25°C to +55°C [-13°F to 131°F]	-25°C to +55°C [-13°F to 131°F]	-25°C to +55°C [-13°F to 131°F]	-25°C to +50°C [-13°F to 22°F]
Temperature Compensation	Continuous	Continuous	Continuous	Continuous
Mechanical Shock Resistance (IEC/EN 60068-2-27) Half-Sinusoidal Shock 10 mS	 10g	 10g	 10g	 10g
Degree of Protection	IP20	IP20	IP20	P00
Protection Against Direct Contact when Actuated from Front (IEC 536)	Finger and back of hand proof	Finger and back of hand proof	Finger and back of hand proof	With terminal cover XTOBXTS...L
Insulation Voltage (Ui) V AC	690	690	690	1000
Overvoltage Category / Pollution Degree	III/3	III/3	III/3	III/3
Impulse Withstand Voltage (Uimp) V AC	6000	6000	6000	8000
Operational Voltage (Ue) V AC	690	690	690	1000
Safe Isolation to VDE 0106 Part 101 and part 101/A1 Between auxiliary contacts and main contacts (V AC) Between main contacts (V AC)	 440 440	 440 440	 440 440	 440 440
Overload Release Setting Range	0.1 – 32A	6 – 75A	25 – 150A	50 – 250A
Short Circuit Protection Maximum Fuse	See **Table 34-125** on **Page 34-96**.			
Temperature Compensation Residual Error > 40°C	<0.25	<0.25	<0.25	<0.25
Current Heat Loss (3 Conductors) Lower value of setting range, W Upper value of setting range	 2.5 6	 3 7.5	 16 28	 16 28
Terminal Capacity Solid, mm^2 Flexible with ferrule, mm^2 Flexible with cable lug, mm^2 Stranded with cable lug, mm^2	 2 x (1 – 6) 2 x (1 – 4) 2 x (1 – 6) ② — —	 2 x (1 – 16) 1 x 25 2 x (1 – 10) ③ — —	 2 x (4 – 16) 1 x (4 – 70) 2 x (4 – 50) — —	 — — — 95 120
Solid or Stranded, AWG	14 - 8	14 - 2	2 / 0	250MCM
Flat Conductor (number of segments x width x thickness, mm^2	—	—	—	6 x 16 x 18
Busbar — Width (mm)	—	—	—	20 x 3
Terminal Screw Tightening Torque Nm Lb-in	M4 1.8 16	M6 3.5 31	M10 10 88.5	M8 x 25 24 221.3
Tools Pozidriv screwdriver Standard screwdriver Hexagon socket head spanner (SW)	 Size 2 1 x 6 —	 Size 2 1 x 6 —	 — — 5 mm	 — — 13 mm
Auxiliary and Control Circuit Connections				
Impulse Withstand Voltage (Uimp) V AC	6000	6000	6000	6000
Overvoltage Category/Pollution Degree	III/3	III/3	III/3	III/3
Terminal Capacity Solid, mm^2 Flexible with ferrule, mm^2 Solid or Stranded (AWG)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)	 2 x (0.75 – 4) 2 x (0.75 – 2.5) 2 x (18 – 12)
Terminal Screw Tightening Torque Nm Lb-in	M3.5 0.8 – 1.2 7 – 10.6	M3.5 0.8 – 1.2 7 – 10.6	M3.5 0.8 – 1.2 7 – 10.6	M3.5 0.8 – 1.2 7 – 10.6
Tools Pozidriv screwdriver Standard screwdriver	 Size 2 1 x 6	 Size 2 1 x 6	 Size 2 1 x 6	 Size 2 1 x 6
Rated Insulated Voltage (Ui) V AC	500	500	500	500
Rated Operational Voltage	500	500	500	500
Safe Isolation to VDE 0106 Part 101 and part 101/A1 Between auxiliary contacts	 240	 240	 240	 240
Conventional Thermal Current, I_{th}	6	6	6	—

① Ambient Temperature Operating Range to IEC/EN 60947, PTB: -5°C to +50°C.
② 6 mm^2 flexible with ferrules to DIN 46228.
③ Main contact terminal capacity, solid and stranded conductors with ferrules: When using 2 conductors use identical cross-section.

Table 34-130. XTOB Overload Relay — Technical Data and Specifications (Continued)

Description	XTOB…BC1, XTOB…CC1	XTOB…DC1	XTOB…GC1, XTOB…GC1S	XTOB...LC1
Auxiliary and Control Circuit Connections (Continued)				
Rated Operational Current — AC-15				
Make Contact				
120V	1.5	1.5	1.5	1.5
240V	1.5	1.5	1.5	1.5
415V	0.5	0.5	0.5	0.5
500V	0.5	0.5	0.5	0.5
Break Contact				
120V	1.5	1.5	1.5	1.5
240V	1.5	1.5	1.5	1.5
415V	0.9	0.9	0.9	0.9
500V	0.8	0.8	0.8	0.8
Rated Operational Current — DC-13 L/R ≤ 15 mS ①				
24V	0.9	0.9	0.9	0.9
60V	0.75	0.75	0.75	0.75
110V	0.4	0.4	0.4	0.4
220V	0.2	0.2	0.2	0.2
Short Circuit Rating without Welding Maximum Fuse, A gG/gl	6	6	6	6

① Rated operational current: Making and breaking conditions to DC-13, L/R constant as stated.

Tripping Characteristics

These tripping characteristics are the mean values of the spread at 20°C ambient temperature in a cold state.

Tripping time depends on response current. With devices at operating temperature, the tripping time of the overload relay reduces to approximately 25% of the read off value. Specific characteristics for each individual setting range can be found in MN03402001E.

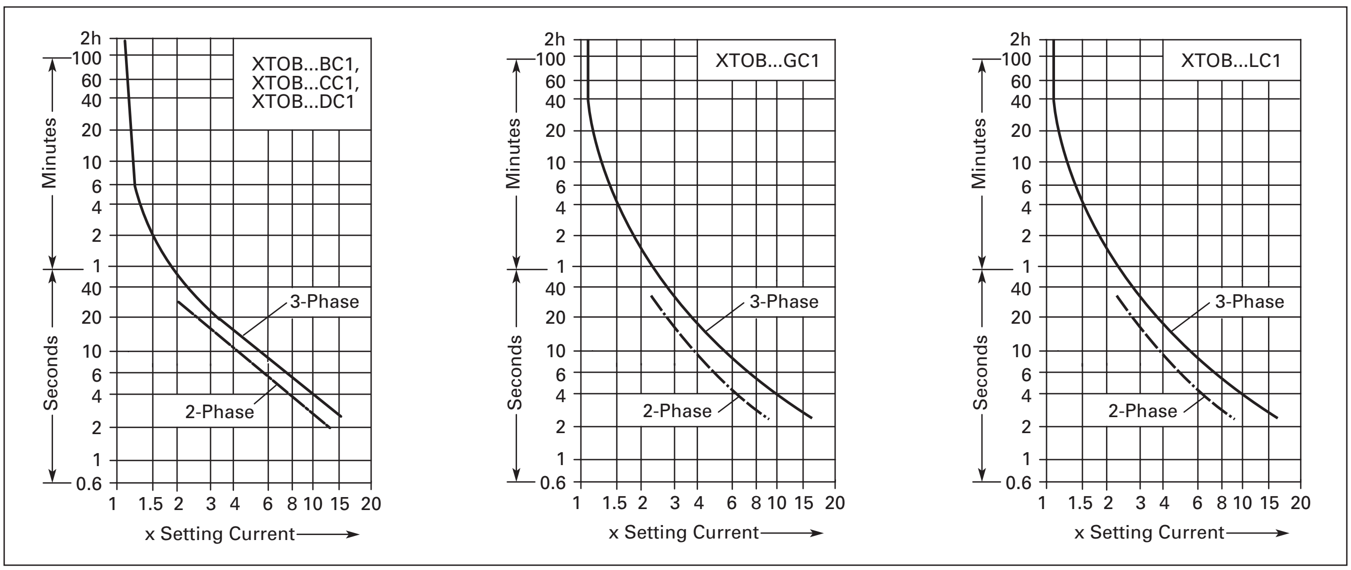


Figure 34-76. Tripping Characteristics

Instructional Leaflets

Table 34-131. Instructional Leaflets

Publication Number	Description
Pub51221	XTOB, D Frame Overload Relays (Inside of Packaging)
Pub51222	XTOB, B – C Frame Overload Relays (Inside of Packaging)

Dimensions

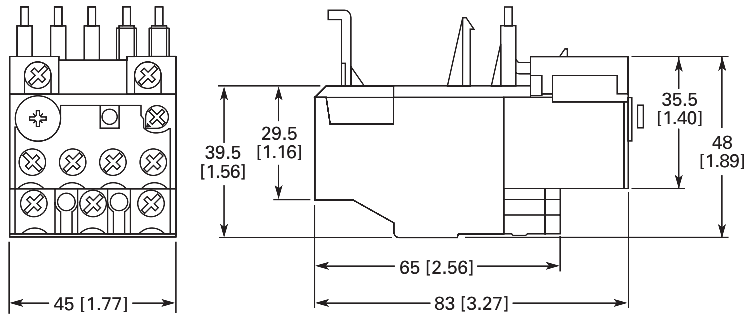


Figure 34-77. Frame B – C, XTOB…BC1 and XTOB…CC1 Overload Relays — Approximate Dimensions in mm [in]

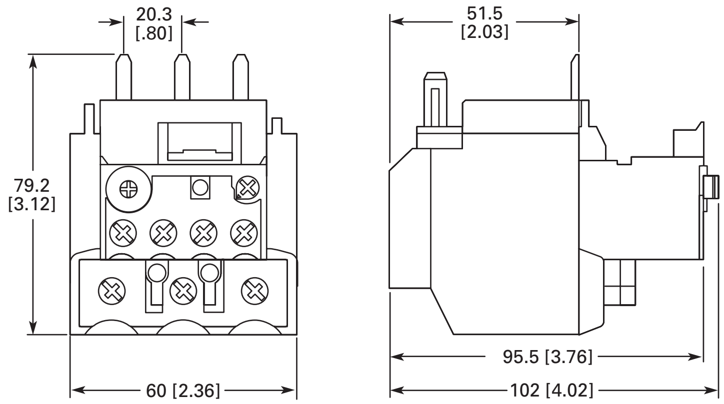
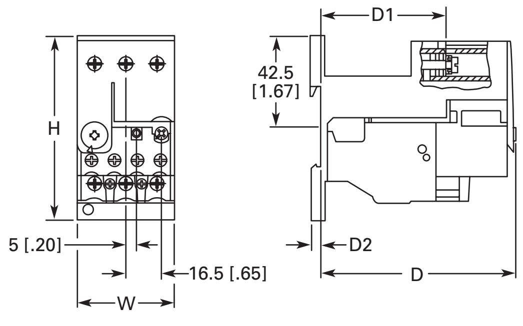


Figure 34-78. Frame D, XTOB…DC1 Overload Relay — Approximate Dimensions in mm [in]



	H	W	D	D1	D2
XTOB…CC1	85 [3.46]	45 [1.77]	90.5 [3.56]	58.3 [2.30]	3.8 [.15]
XTOB…DC1	86 [3.39]	60 [2.36]	112 [4.41]	80.5 [3.17]	4.7 [.19]

Figure 34-79. Frame B – C, XTOBXDINC DIN Rail or Panel Mount Adapter and Frame D, XTOBXDIND DIN Rail or Panel Mount Adapter — Approximate Dimensions in mm [in]

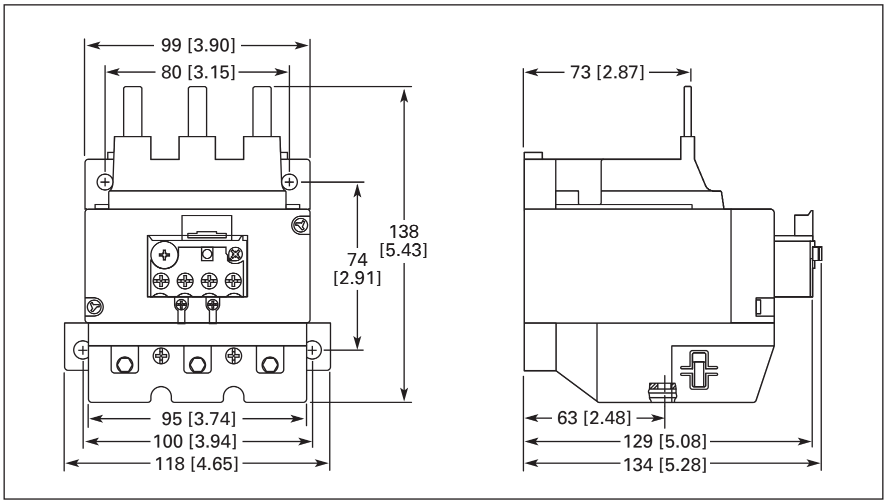


Figure 34-80. Frame F – G, XTOB…GC1 Overload Relay — Approximate Dimensions in mm [in]

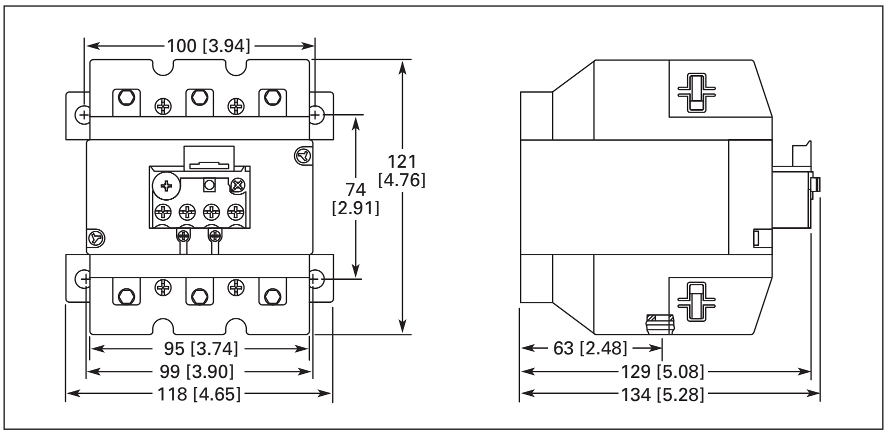


Figure 34-81. Frame F – G, XTOB…G1CS Overload Relay — Approximate Dimensions in mm [in]

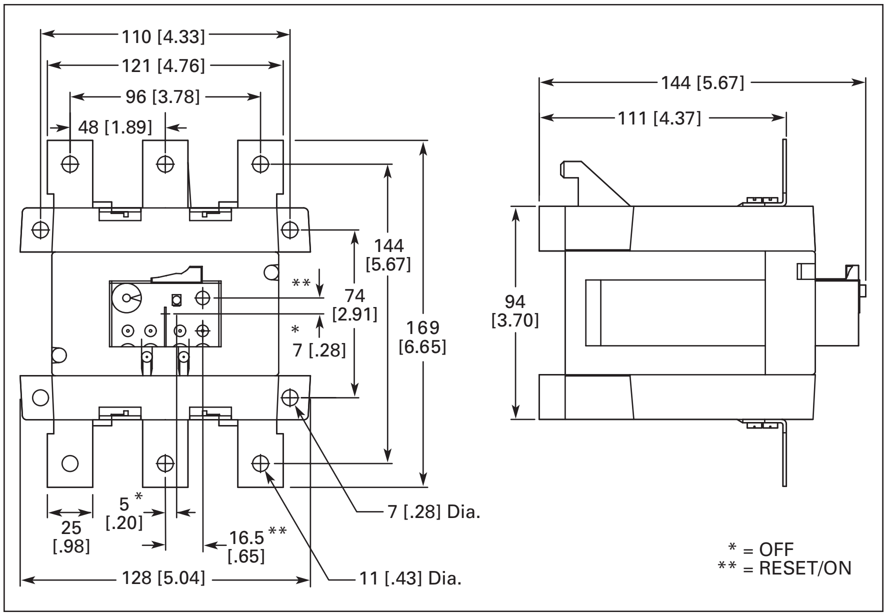


Figure 34-82. Frame L, XTOB…LC1 Overload Relay — Approximate Dimensions in mm [in]

Current Transformer Operated Overload Relay

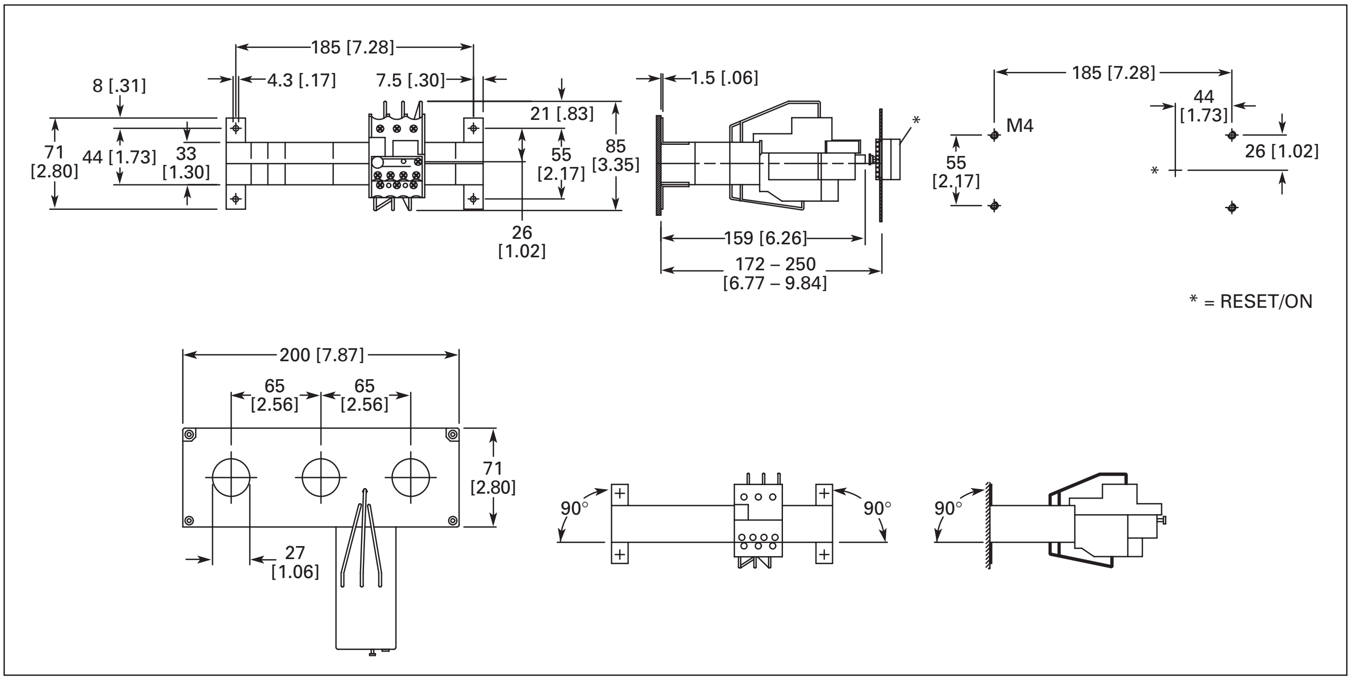
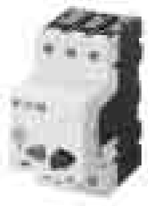


Figure 34-83. XTOT…C3S — Approximate Dimensions in mm [in]

34

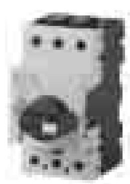
Contents

Pushbutton



B-Frame

Rotary



B-Frame



D-Frame

Product Description

Eaton's new ***XT*** family of Manual Motor Protectors (MMPs) features a pushbutton or rotary ON/OFF manual disconnect, Class 10 adjustable bimetallic overload relay and fixed magnetic short circuit trip capability in one compact unit. Two frame sizes are available: Frame B (45 mm) for motors with FLA ratings up to 32A and Frame D (55 mm) covers motor FLA ratings up to 63A.

Application Description

The XTPB and XTPR MMPs can be used in the following applications.

Motor Protective Circuit Breaker

In many countries outside of the United States and Canada, especially Europe, the MMPs are tested and classified as thermal magnetic circuit breakers for use in motor branch circuits. This can be an important consideration for all companies who export their equipment and machines internationally. Both the XTPB and XTPR conform to IEC/EN 60947 and have the CE Mark.

Manual Motor Protectors

The XTPB and XTPR MMPs are UL Listed under UL 508 as Manual Motor Protectors. They provide an economical solution for applications requiring simple manual starting and stopping of motors. When used as an MMP, they are typically installed in an enclosure. Many enclosures are offered as accessories for the MMPs. Separate short-circuit protective devices, such as circuit breakers or fuses, are wired ahead of the MMPs. The short-circuit protective device should be sized per the NEC code and should not exceed 400% of the maximum FLA dial setting of the MMP.

Group Motor Installations

A Group Motor Installation can be defined as more than one motor circuit protected by a single set of fuses or circuit breaker on a motor branch circuit. This eliminates the need for individual fuses or circuit breakers for each motor circuit. Substantial component cost savings, panel space savings and reduced wiring installation time can be achieved in Group Motor Installations.

The MMPs are tested and listed for group installation. If remote operation is required, a magnetic contactor can be wired in series with the MMP. See **Figure 34-98**.

Article 430.53 of the National Electric Code contains the rules and requirements for Group Motor Installations. Refer to Application Note AP03402001E for NEC requirement for group motor installation.

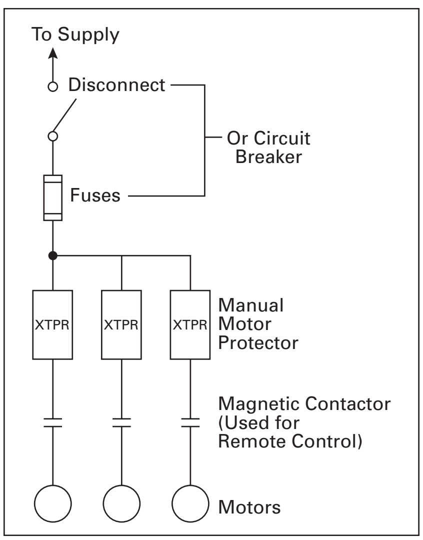


Figure 34-98. Group Motor Installation NEC 430-53

See Application Note — AP03402001E.

Protection in Different Controller Types

A UL 508 Type E Self-protected Manual Combination Starter/Motor Controller consists of a single device having integral short circuit protection, a main set of contacts, motor overload protection, and may also include a UL listed Line Side Adapter (see **Figure 34-99**). This type of controller is a legitimate short circuit protective device and disconnect means for the downstream motor. It does require an upstream feeder short circuit protective device, but does not require a dedicated branch circuit protection or a disconnect means. A UL 508 Type E rating means that the unit clears a fault and does not experience any welding of the power poles. A UL 508 Type E self-protected manual combination starter will remain fully functional should a short circuit within its ratings occur.

A UL 508 Type F Self-protected Combination Motor Controller consists of a UL 508 Listed Type E Self-protected Manual Combination Starter/Motor Controller, a UL Listed Contactor, and possibly a UL Listed Line Side Adapter. While the Type E self-protected manual motor controller of this combination motor controller device is a legitimate short circuit protective device and disconnect means for the downstream motor, the contactor is *not* "self-protected." *E.g.* XTCE007 – XTCE065.

In addition, as a complete assembly or modular components, the device should have Type 2 Coordination certification. Type 2 Coordination means the Starter or the Controller must exhibit little or no damage following a major short circuit fault and should be able to be returned to proper service without replacing any parts.

Component in a Combination Motor Controller

The XTPB and XTPR MMPs can also be wired in series with a magnetic contactor to complete the assembly of a remotely operated, combination motor controller.

Features

- ON/OFF Rotary Handle with Lockout Provision
- Visible Trip Indication
- Class 10 Overload Protection
- Phase Loss Sensitivity
- Ambient Temperature Compensation to IEC/EN 60947, VDE 0660
- Fixed Short Circuit Trip — 14 times maximum setting of overload FLA dial
- Type 2 Coordination per IEC 947
- Identification Markers Standard on Starter Faceplate
- Motor Applications from 0.1A to 63A
- Built-in heater and magnetic trip elements to protect the motor
- Adjustment dial for setting motor FLA
- DIN Rail Mount
- Terminal Types Available:
  - Screw terminals
  - Screw (line) and Spring Cage (load) terminals
  - Spring Cage terminals
- Accessories include:
  - Front and Side Auxiliary Contacts
  - Trip Indicating Contacts
  - Tamperproof Cover for OLR Dial
  - Undervoltage Release
  - Shunt Trip
  - Thru-the-Door Operators
  - Enclosures
  - 3-Phase Line Side Connecting Links

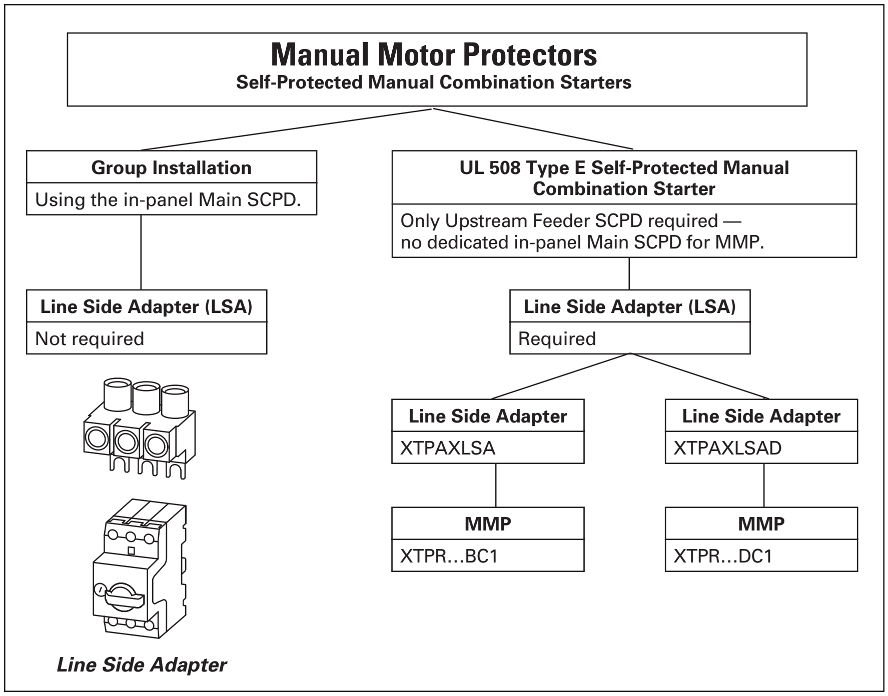


Figure 34-99. Line Side Adapters — When to Use Them

Note: Line Side Adapters are not required for non-US applications. Most countries outside of the US classify the MMP as a thermal magnetic circuit breaker.

Standards and Certifications

- UL Listed File No. E245398
- UL 508 Group Motor and Type E Compliant
- IEC/EN 60947
- CSA File LR12530, Class 3211-05
- DIN VDE 0660 Part 100, Part 101 and Part 102
- CCC

Note: For Type 2 Coordination of MMCs, see **Tables 34-247** through **34-249** on **Pages 34-200** and **34-201**.

Types (Configurations)

- Motor Protective Device with Thermal and Magnetic Trip
  - XTPB Pushbutton Actuated Manual Motor Protector up to 25A
  - XTPR Rotary Actuated Manual Motor Protector up to 63A
- For the Protection of Transformers with a high inrush current:
  - XTPT Manual Transformer Protector up to 25A — not UL Approved
- Motor Protective Device without Overload Function:
  - XTPM Motor Protective Circuit Breaker up to 32A — not UL Approved

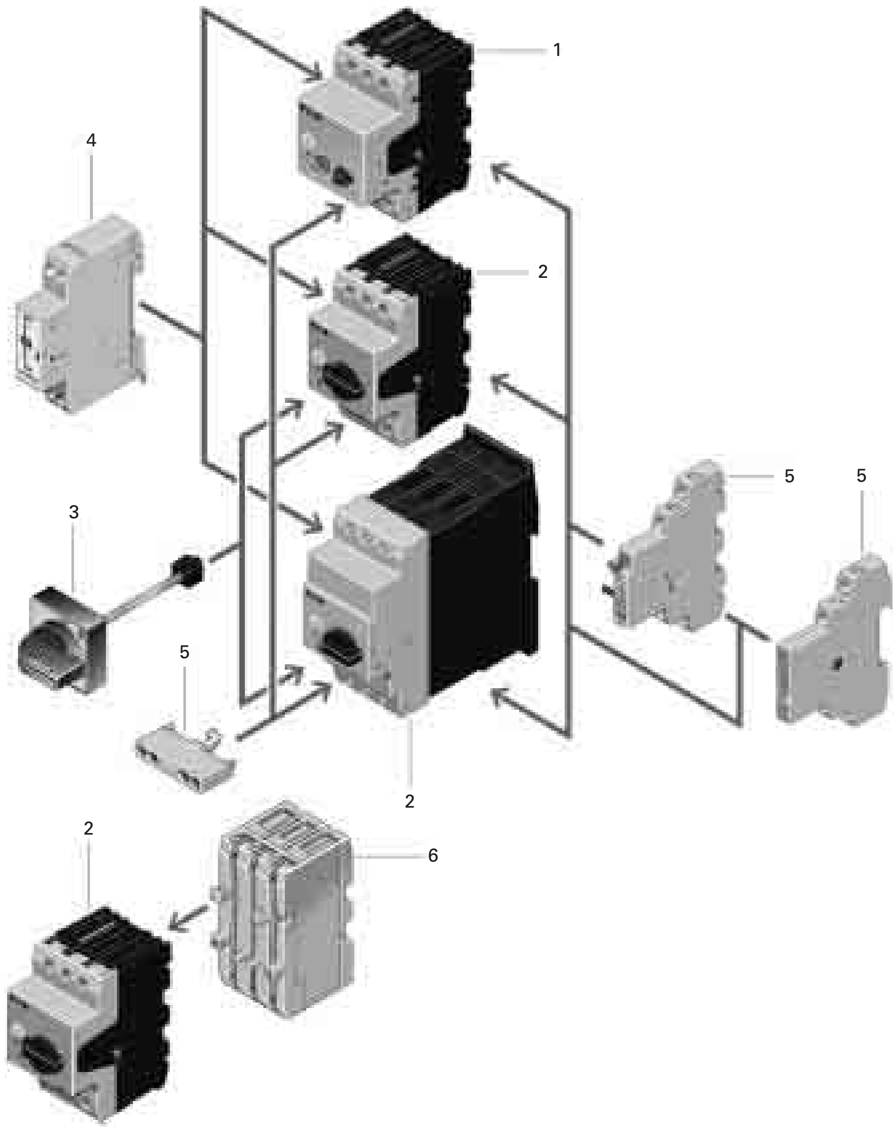
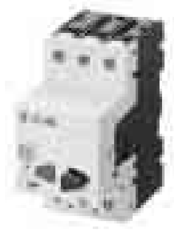


Table 34-176. Product Identification

No.	Description	Page
Basic Units		
1	XTPB Pushbutton Manual Motor Protectors: ■ Rated operational current up to 25A ■ Switching capacity 50 kA/415V ■ Short circuit release, fixed setting to 14 x I_u ■ Overload release, adjustable 0.6 — 1 x I_u ■ Single-phasing sensitive	**34-143**
2	XTPR Rotary Manual Motor Protectors: ■ Rated operational current up to 32A, 65A ■ Switching capacity 150/50 kA/ 415V ■ Short circuit release, fixed setting to 14 x I_u ■ Overload release, adjustable 0.6 — 1 x I_u ■ Single-phasing sensitive ■ With screws or spring-loaded terminals	**34-144**
Mounting Accessories		
3	Rotary Handle Mechanism: ■ ON/OFF/Tripped switch position indication ■ Lockable with 3 padlocks ■ Integrated door/cover interlock ■ Extendable by plug fit extension shaft ■ Handle latched in switch positions ■ Optionally also without locking and door interlock function	**34-151**
	Insulated Enclosures: ■ Surface mounting enclosures, IP40, IP55 and IP40 and IP55 front flush mounting enclosure	**34-156**
	Mounting/Wiring: ■ Component adapter for busbar mounting ■ Three-phase commoning link for side-by-side mounting ■ Mounting kits for rapid mounting of direct-on-line, reversing and star-delta starters	**34-152**
Add-On Functions		
4	Voltage Releases: ■ Undervoltage release ■ Shunt release ■ With screws or spring-loaded terminals	**34-150**
5	Standard Auxiliary Contacts: ■ ON/OFF indication ■ Differential fault indication overload/short circuit release ■ ON/OFF for (high capacity) contact module ■ ON/OFF for starter combination ■ With early-make contacts ■ With screws or spring-loaded terminals	**34-148**
6	Current Limiter: ■ Increases the switching capacity of the 10 – 25A Manual Motor Protectors to 100 kA/440V ■ Can be used for individual group protection	**34-150**

34



XTPB
B-Frame



XTPR, XTPM and XTPT
B-Frame



XTPR
D-Frame

Catalog Number Selection

Table 34-177. XT— Catalog Numbering System

XT PR 012 B C1

Designation
XT = ***XT*** IEC Power Control

Type
PB = Manual Motor Protector — Pushbutton
PR = Manual Motor Protector — Rotary
PM = Manual Motor Protector — Magnetic Only
PT = Manual Transformer Protector (High Mag.)

Current Ratings	
B Frame	
P16 = 0.16A	**6P3** = 6.3A
P25 = 0.25A	**010** = 10A
P40 = 0.40A	**012** = 12A
P63 = 0.63A	**016** = 16A
001 = 1A	**020** = 20A
1P6 = 1.6A	**025** = 25A
2P5 = 2.5A	**032** = 32A
004 = 4A	
D Frame	
016 = 16A	**050** = 50A
025 = 25A	**058** = 58A
032 = 32A	**063** = 63A
040 = 40A	

Frame Size	
B = 45 mm	**D** = 55 mm

Trip Class
C1 = Class 10
Blank = Magnetic only (No thermal trip)

Product Selection

Product Selection for Manual Motor Starter Applications

When ordering, specify Catalog Numbers according to the following stipulations:

XT Manual Motor Protectors are selected based on the overload current range required for a given motor. This current range is determined from the motor Full Load Ampere rating and Motor Service Factor usually found on the motor nameplate.

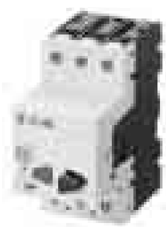
For motors with service factors less than 1.15, multiply the motor FLA by .90 to select appropriate MMP.

Example: For motor having FLA of 6.4A and service factor of 1.0 (6.4A x .90 = 5.76A) select Catalog Number XTPB6P3B01.

See Application Note — AP03402001E.

For motor with service factor of 1.15 or greater, use motor nameplate Full Load Amperes to select the appropriate MMP.

Example: For motor having FLA of 11A and service factor of 1.15, select Catalog Number XTPR012BC1.



B-Frame

Table 34-178. XTPB Pushbutton Manual Motor Protectors — Global and North American Ratings
Type 1 and Type 2 Coordination
Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — $I_u = I_e$ (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals	
			Maximum kW Rating AC-3 — P (kW)					Maximum hp Rating — P (hp) UL 508/CSA C 22.2 No. 14				Catalog Number	Price U.S. $
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	240V	480V	600V		
Frame B													
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	②	②	②	②	**XTPBP16BC1**	
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	**XTPBP25BC1**	
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	**XTPBP40BC1**	
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	**XTPBP63BC1**	
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	②	②	1/2	1/2	**XTPB001BC1**	
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**XTPB1P6BC1**	
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPB2P5BC1**	
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPB004BC1**	
6.3	4 – 6.3	88	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPB6P3BC1**	
10	6.3 – 10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPB010BC1**	
12	8 – 12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPB012BC1**	
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	10	**XTPB016BC1**	
20	16 – 20	280	5.5	9	11	12.5	15	5	5	10	15	**XTPB020BC1**	
25	20 – 25	350	5.5	12.5	12.5	15	22	5	7-1/2	15	20	**XTPB025BC1**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430.250.

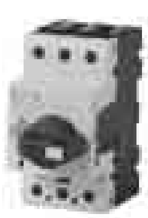
Notes:
Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.
Service Factor (SF) — Setting I_r of current scale in dependence of load factor:

SF = 1.15 -> $I_r = 1 \times I_{n\ mot}$
SF = 1 -> $I_r = 0.9 \times I_{n\ mot}$

For manual motor protective circuit breaker switching capacity, see **Page 34-165**.

Technical Data .... **Page 34-160**
Discount Symbol **1CD7**

Manual Motor Protectors



B-Frame



D-Frame

Table 34-179. XTPR Rotary Manual Motor Protectors with Screw Terminals — Global Ratings and North American Ratings
Type 1 and Type 2 Coordination
Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — $I_u = I_e$ (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals ③	
			Maximum kW Rating AC-3 — P (kW)					Maximum hp Rating — P (hp) UL 508/CSA C 22.2 No. 14				Catalog Number	Price U.S. $
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	240V	480V	600V		
Frame B													
0.16	0.1 – 0.16	2.2	—	—	—	—	0.06	②	②	②	②	**XTPRP16BC1**	
0.25	0.16 – 0.25	3.5	—	0.06	0.06	0.06	0.12	②	②	②	②	**XTPRP25BC1**	
0.4	0.25 – 0.4	5.6	0.06	0.09	0.12	0.12	0.18	②	②	②	②	**XTPRP40BC1**	
0.63	0.4 – 0.63	8.8	0.09	0.12	0.18	0.25	0.25	②	②	②	②	**XTPRP63BC1**	
1	0.63 – 1	14	0.12	0.25	0.25	0.37	0.55	②	②	1/2	1/2	**XTPR001BC1**	
1.6	1 – 1.6	22	0.25	0.55	0.55	0.75	1.1	②	②	3/4	1	**XTPR1P6BC1**	
2.5	1.6 – 2.5	35	0.37	0.75	1.1	1.1	1.5	1/2	1/2	1	1-1/2	**XTPR2P5BC1**	
4	2.5 – 4	56	0.75	1.5	1.5	2.2	3	1	1	2	3	**XTPR004BC1**	
6.3	4 – 6.3	88	1.1	2.2	3	3	4	1-1/2	1-1/2	3	5	**XTPR6P3BC1**	
10	6.3 – 10	140	2.2	4	4	4	7.5	3	3	7-1/2	10	**XTPR010BC1**	
12	8 – 12	168	3	5.5	5.5	5.5	11	3	3	7-1/2	10	**XTPR012BC1**	
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	10	**XTPR016BC1**	
20	16 – 20	280	5.5	9	11	12.5	15	5	5	10	15	**XTPR020BC1**	
25	20 – 25	350	5.5	12.5	12.5	15	22	5	7-1/2	15	20	**XTPR025BC1**	
32	25 – 32	448	7.5	15	15	22	30	7-1/2	10	25	30	**XTPR032BC1**	
Frame D													
16	10 – 16	224	4	7.5	9	9	12.5	3	5	10	15	**XTPR016DC1**	
25	16 – 25	350	5.5	12.5	12.5	15	22	7-1/2	7-1/2	20	25	**XTPR025DC1**	
32	25 – 32	448	7.5	15	17.5	22	22	10	10	25	30	**XTPR032DC1**	
40	32 – 40	560	11	20	22	24	30	10	15	30	40	**XTPR040DC1**	
50	40 – 50	700	14	25	30	30	45	10	15	30	40	**XTPR050DC1**	
58	50 – 58	812	17	30	37	37	55	—	—	40	—	**XTPR058DC1**	
65	55 – 65	882	18.5	34	37	45	55	—	—	—	—	**XTPR063DC1**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430.250.
③ Catalog number shown comes with screw terminals. For Frame B devices up to 16A, spring cage terminals are available. For spring cage terminals on line and load sides, insert a "C" into the catalog number in the 5th position — Example: XTPR**C**_BC1. For spring cage terminals on the load side only, insert an "SC" into the catalog number in the 5th and 6th positions — Example: XTPR**SC**_BC1.

Notes:

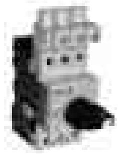
Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.
Service Factor (SF) — Setting I_r of current scale in dependence of load factor:

$SF = 1.15 \rightarrow I_r = 1 \times I_{n\ mot}$

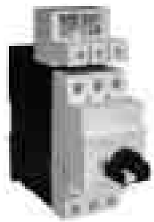
$SF = 1 \rightarrow I_r = 0.9 \times I_{n\ mot}$

For manual motor protective circuit breaker switching capacity, see **Page 34-165**.

Technical Data .... **Page 34-160**
Discount Symbol **1CD7**



B-Frame



D-Frame

Table 34-180. XTPR Manual Self-Protected Motor Starters — North American Ratings, UL 508 Type E ③
Motor Protective Device with Thermal and Magnetic Trip

Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ① Maximum hp Rating — P (hp) 3-Phase 200V	240V	480V/277V	600V/247V	Rated Short-Circuit Breaking Capacity (kA) 240V	480/277V	600/347V	Line Side Adapter ③ Catalog Number	Price U.S. $	Manual Motor Protector — Screw Terminals Catalog Number	Price U.S. $
Frame B													
0.16	0.1 – 0.16	2.2	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP16BC1**	
0.25	0.16 – 0.25	3.4	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP25BC1**	
0.4	0.25 – 0.4	5.6	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP40BC1**	
0.63	0.4 – 0.63	8.8	②	②	②	②	50	50	50	**XTPAXLSA**		**XTPRP63BC1**	
1	0.63 – 1	14	②	②	1/2	1/2	50	50	50	**XTPAXLSA**		**XTPR001BC1**	
1.6	1 – 1.6	22	②	②	3/4	1	50	50	50	**XTPAXLSA**		**XTPR1P6BC1**	
2.5	1.6 – 2.5	35	1/2	1/2	1	1-1/2	50	50	50	**XTPAXLSA**		**XTPR2P5BC1**	
4	2.5 – 4	56	1	1	2	3	50	50	50	**XTPAXLSA**		**XTPR004BC1**	
6.3	4 – 6.3	88	1-1/2	1-1/2	3	5	50	50	50	**XTPAXLSA**		**XTPR6P3BC1**	
10	6.3 – 11	140	3	3	7-1/2	10	50	50	50	**XTPAXLSA**		**XTPR010BC1**	
12	8 – 12	168	3	3	7-1/2	10	42	42	—	**XTPAXLSA**		**XTPR012BC1**	
16	10 – 16	224	3	5	10	10	42	42	—	**XTPAXLSA**		**XTPR016BC1**	
20	16 – 20	280	5	5	10	15	42	42	—	**XTPAXLSA**		**XTPR020BC1**	
25	20 – 25	350	5	7-1/2	15	20	18	18	—	**XTPAXLSA**		**XTPR025BC1**	
32	25 – 32	448	7-1/2	10	25	30	18	18	—	**XTPAXLSA**		**XTPR032BC1**	
Frame D													
16	10 – 16	224	3	5	10	15	50	50	10	**XTPAXLSAD**		**XTPR016DC1**	
25	16 – 25	224	5	7-1/2	20	25	50	50	10	**XTPAXLSAD**		**XTPR025DC1**	
32	25 – 32	350	7-1/2	10	25	30	50	50	10	**XTPAXLSAD**		**XTPR032DC1**	
40	32 – 40	448	10	15	30	40	50	50	10	**XTPAXLSAD**		**XTPR040DC1**	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430.250.
③ UL 508 Type E starters are assembled from a standard XTPR and a special incoming terminal Line Side Adapter (XTPAXLSA or XTPAXLSAD).

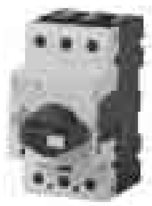
Notes:

A UL 508 Type E Self-Protected Manual Combination Starter (XTPR) consists of a Manual Motor Protector (XTPR) and a UL Listed Line Side Adapter (e.g. XTPAXLSA). The Type E Self-Protected Manual Combination Starter alone is a legitimate short-circuit protective device and disconnect means for the downstream motor, while the contactor has been added to provide remote operation of the motor circuit.

Accessories .... **Page 34-148**
Technical Data .... **Page 34-160**
Discount Symbol **1CD7**

April 2007

Manual Motor Protectors



B-Frame

Table 34-181. XTPT Transformer Protective Circuit Breakers — Global Ratings ①②
Type 1 and Type 2 Coordination
For the protection of transformers with a high inrush current. Fixed short-circuit trip of 15 – 22 times max. settings of FLA

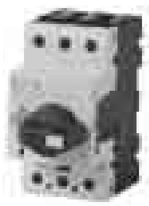
Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings									Screw Terminals	
			Maximum kW Rating AC-3 — P (kW)					Maximum hp Rating — P (hp)				Catalog Number	Price U.S. $
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	240V	480V	600V		
Frame B													
0.16	0.1 – 0.16	2.4	—	—	—	—	—	—	—	—	—	**XTPTP16BC1**	
0.25	0.16 – 0.25	4.25	—	—	—	—	—	—	—	—	—	**XTPTP25BC1**	
0.4	0.25 – 0.4	6.8	—	—	—	—	—	—	—	—	—	**XTPTP40BC1**	
0.63	0.4 – 0.63	12	—	—	—	—	—	—	—	—	—	**XTPTP63BC1**	
1	0.63 – 1	20	—	—	—	—	—	—	—	—	—	**XTPT001BC1**	
1.6	1 – 1.6	32	—	—	—	—	—	—	—	—	—	**XTPT1P6BC1**	
2.5	1.6 – 2.5	50	—	—	—	—	—	—	—	—	—	**XTPT2P5BC1**	
4	2.5 – 4	84	—	—	—	—	—	—	—	—	—	**XTPT004BC1**	
6.3	4 – 6.3	141	—	—	—	—	—	—	—	—	—	**XTPT6P3BC1**	
10	6.3 – 10	224	—	—	—	—	—	—	—	—	—	**XTPT010BC1**	
12	8 – 12	224	—	—	—	—	—	—	—	—	—	**XTPT012BC1**	
16	10 – 16	358	—	—	—	—	—	—	—	—	—	**XTPT016BC1**	
20	16 – 20	380	—	—	—	—	—	—	—	—	—	**XTPT020BC1**	
25	20 – 25	420	—	—	—	—	—	—	—	—	—	**XTPT025BC1**	

① For manual motor protective circuit breaker switching capacity, see **Page 34-165**.
② XTPT is not UL/CSA approved.

Notes:
For the protection of transformers with a high inrush current.
Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.
Can be snap-fit to IEC/EN 60715 top-hat (DIN) with 7.5 or 15 mm height.
Service Factor (SF) — Setting I_r of current scale in dependence of load factor:

SF = 1.15 -> $I_r = 1 \times I_{n\ mot}$
SF = 1 -> $I_r = 0.9 \times I_{n\ mot}$

Accessories .... **Page 34-148**
Technical Data .... **Page 34-160**
Discount Symbol **1CD7**



B-Frame

Table 34-182. XTPM Motor Protective Circuit Breakers for Starter Combinations — Global Ratings
Type 1 and Type 2 Coordination
Motor Protective Device without Overload Function

Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①									Screw Terminals	
			Maximum kW Rating AC-3 — P (kW)					Maximum hp Rating — P (hp) ②				Catalog Number	Price U.S. $
			3-Phase					3-Phase					
			220 – 240V	380 – 415V	440V	500V	660 – 690V	200V	240V	480V	600V		
Frame B													
0.16	—	2.2	—	—	—	—	0.06	—	—	—	—	XTPMP16B	
0.25	—	3.5	—	0.06	0.06	0.06	0.12	—	—	—	—	XTPMP25B	
0.4	—	5.6	0.06	0.09	0.12	0.12	0.18	—	—	—	—	XTPMP40B	
0.63	—	8.8	0.09	0.12	0.18	0.25	0.25	—	—	—	—	XTPMP63B	
1	—	14	0.12	0.25	0.25	0.37	0.55	—	—	—	—	XTPM001B	
1.6	—	22	0.25	0.37	0.55	0.75	1.1	—	—	—	—	XTPM1P6B	
2.5	—	35	0.37	0.75	1.1	1.1	1.5	—	—	—	—	XTPM2P5B	
4	—	56	0.75	1.5	1.5	2.2	3	—	—	—	—	XTPM004B	
6.3	—	88	1.1	2.2	3	3	4	—	—	—	—	XTPM6P3B	
10	—	140	2.2	4	4	4	7.5	—	—	—	—	XTPM010B	
12	—	168	3	5.5	5.5	5.5	11	—	—	—	—	XTPM012B	
16	—	224	4	7.5	9	9	12.5	—	—	—	—	XTPM016B	
20	—	280	5.5	9	11	12.5	15	—	—	—	—	XTPM020B	
25	—	350	5.5	12.5	12.5	15	22	—	—	—	—	XTPM025B	
32	—	448	7.5	15	15	22	30	—	—	—	—	XTPM032B	

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② XTPM is not UL/CSA Approved.

Notes:
Can be snap-fit to IEC/EN 60715 top-hat rail with 7.5 or 15 mm height
An appropriate overload relay must be fitted to protect motors against overload.
Combinations of the XTPM Manual Motor Protectors and XTCE/XTCR Contactors + XTOB Overload Relays can be found in the ***XT*** Manual and Combination Motor Controllers section.
When using the XTPM as short-circuit protection for motors with heavy starting duty, the rated operational current I_e must be derated during engineering with the following factors:

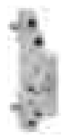
Class 5 = 1.0
Class 10 = 1.0
Class 15 = 0.82
Class 20 = 0.71
Class 25 = 0.63
Class 30 = 0.58
Class 35 = 0.53
Class 40 = 0.50

Accessories .... **Page 34-148**
Technical Data .... **Page 34-160**
Discount Symbol **1CD7**

Accessories

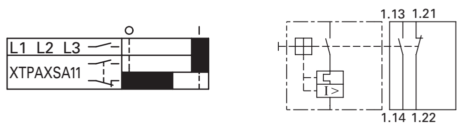
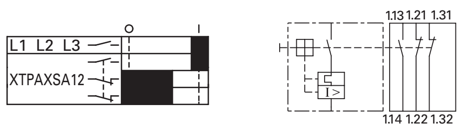
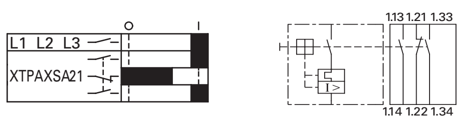
Auxiliary Contacts

Side-Mount Auxiliary Contacts



Can be fitted on the right side of manual motor protectors (XTPB, XTPR, XTPM) and manual transformer protectors (XTPT) and can be combined with XTPAXSATR… and XTPAXFA… trip indicating auxiliary contact.

Table 34-183. Side-Mount Auxiliary Contacts

Contact Configuration	Contact Sequence	Screw Terminals		Spring Cage Terminals		Price U.S. $ ①
		Pkg. Qty.	Catalog Number	Pkg. Qty.	Catalog Number	
1NO-1NC		1	**XTPAXSA11**	5	**XTPAXSAC11**	
1NO-2NC		1	**XTPAXSA12**	—	—	
2NO-1NC		1	**XTPAXSA21**	—	—	

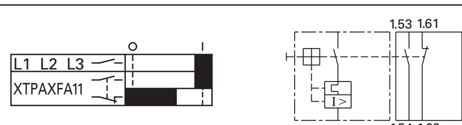
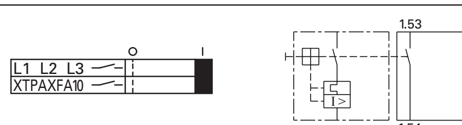
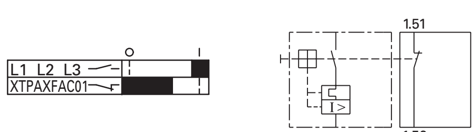
① Orders must be placed in multiples of package quantity listed.

Front-Mount Auxiliary Contacts



Can be fitted to manual motor protectors (XTPB, XTPR, XTPM) and manual transformer protectors (XTPT). 45 mm (XTPR…B and XTPB) or 55 mm (XTPR…D) widths of manual motor protectors remain unchanged.

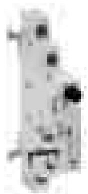
Table 34-184. Front-Mount Auxiliary Contacts

Contact Configuration	Contact Sequence	Screw Terminals		Spring Cage Terminals		Price U.S. $ ②
		Pkg. Qty.	Catalog Number	Pkg. Qty.	Catalog Number	
1NO-1NC		1	**XTPAXFA11**	—	—	
1NO-0NC		1	**XTPAXFA10**	5	**XTPAXFAC10**	
0NO-1NC		—	—	5	**XTPAXFAC01**	

② Orders must be placed in multiples of package quantity listed.

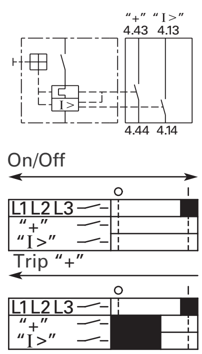
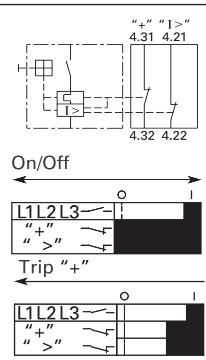
Discount Symbol **1CD7**

Side-Mount Trip Indicating Auxiliary Contacts



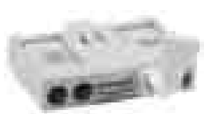
Can be fitted on the right side of manual motor protectors. Can be combined with standard auxiliary contacts. Trip indication: A. General Trip indication (overload) B. Short-circuit trip. Local short-circuit indication by red indicator, manually resettable.

Table 34-185. Side-Mount Trip Indicating Auxiliary Contacts

Contact Configuration	Contact Sequence	Pkg. Qty.	For Use with…	Catalog Number	Price U.S. $ ①
2 x 1NO		2	XTPB, XTPR, XTPM, XTPT	**XTPAXSATR20**	
2 x 1NC		2	XTPB, XTPR, XTPM, XTPT	**XTPAXSATR02**	

① Orders must be placed in multiples of package quantity listed.

Early-Make Front-Mount Auxiliary Contacts



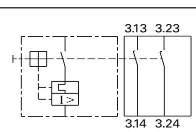
XTPBXFAEM20



XTPAXFAEM20

For use with XTPB…, B-Frame XTPR and XTPT. Can be fitted to the front of a manual motor protector. 45 mm width of manual motor protector remains unchanged. For early energization of undervoltage release, e.g. in Emergency-Stop circuits to EN 60204.

Table 34-186. Early-Make Front-Mount Auxiliary Contacts

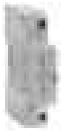
Contact Configuration	Contact Sequence	Pkg. Qty.	For Use with…	Catalog Number	Price U.S. $ ②
2NO		5	XTPB	**XTPBXFAEM20**	
2NO		2	XTPR, XTPM, XTPT	**XTPAXFAEM20**	

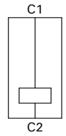
② Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

34

Shunt Release





Contact Sequence

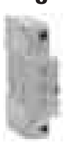
Can be used to trip the manual motor protector from a remote location. Can be fitted on the left side of manual motor protectors. Cannot be combined with the XTPAXUVR. DC: Intermittent operation 5 sec.

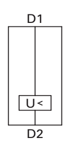
Table 34-187. Shunt Release

Catalog Number — Screw Terminals	Catalog Number — Spring Cage Terminals	Pkg. Qty.	Price U.S. $ ①
XTPAXSR24V50H	—	2	
XTPAXSR48V50H	—	2	
XTPAXSR110V50H	—	2	
XTPAXSR120V60H	—	2	
XTPAXSR208V60H	—	2	
XTPAXSR220V50H	—	2	
XTPAXSR230V50H	XTPAXSRC230V50H	2	
XTPAXSR240V50H	—	2	
XTPAXSR240V60H	—	2	
XTPAXSR380V50H	—	2	
XTPAXSR400V50H	—	2	
XTPAXSR415V50H	—	2	
XTPAXSR440V60H	—	2	
XTPAXSR480V60H	—	2	
XTPAXSR24VDC	XTPAXSRC24VDC	2	
XTPAXSR48VDC	—	2	
XTPAXSR60VDC	—	2	
XTPAXSR110VDC	—	2	
XTPAXSR125VDC	—	2	
XTPAXSR220VDC	—	2	
XTPAXSR250VDC	—	2	

① Orders must be placed in multiples of package quantity listed.

Undervoltage Release





Contact Sequence

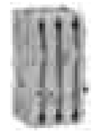
Can be used to trip the manual motor protector from a remote location. Can be fitted on left side manual motor protectors. Cannot be combined with XTPAXSR. When combined with a circuit breaker, it can be used as Emergency-Stop device to IEC/EN 60204.

Table 34-188. Undervoltage Release

Catalog Number — Screw Terminals	Catalog Number — Spring Cage Terminals	Pkg. Qty.	Price U.S. $ ②
XTPAXUVR24V50H	—	2	
XTPAXUVR24V60H	—	2	
XTPAXUVR48V50H	—	2	
XTPAXUVR60V50H	—	2	
XTPAXUVR110V50H	—	2	
XTPAXUVR120V60H	—	2	
XTPAXUVR208V60H	—	2	
XTPAXUVR220V50H	—	2	
XTPAXUVR230V50H	XTPAXUVRC230V50H	2	
XTPAXUVR240V50H	—	2	
XTPAXUVR240V60H	—	2	
XTPAXUVR380V50H	—	2	
XTPAXUVR400V50H	—	2	
XTPAXUVR415V50H	—	2	
XTPAXUVR440V60H	—	2	
XTPAXUVR480V60H	—	2	
XTPAXUVR600V60H	—	2	

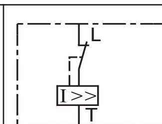
② Orders must be placed in multiples of package quantity listed.

Current Limiter ③



The XTPAXCL enhances the switching capacity of the XT manual motor protectors. It can be used with the XTPB, XTPR...BC1, XTPR...DC1 for individual or group protections. The rated uninterrupted current is 63A for IEC and 25A for UL/CSA. It can be mounted next to or behind the manual motor protector. See **Tables 34-218** and **34-219** for ratings when using the current limiter.

Table 34-189. Current Limiter

Description	Contact Sequence	Pkg. Qty.	Catalog Number	Price U.S. $
To enhance the switching capacity of non-inherently safe 10 – 25A Manual Motor Protectors to 150 kA/ 440V		1	**XTPAXCL**	

③ Max. rated operation voltage U_e = 690V, rated uninterrupted current I_u = 63A. Can be used for individual and group protection. For group protection and in combination with the XTPR…D, order additional XTPAXIT incoming terminal if required. Mounting next to or behind the manual motor protector. 16 – 63A XTPR...D: 100 kA/400V, 10 kA/690V.

Lockable Rotary Handle



Table 34-190. Replacement Lockable Rotary Handle

Description	Pkg. Qty.	Catalog Number	Price U.S. $ ④
Lockable Rotary Handle that mounts directly to the XTPR manual motor protectors. Comes standard with XTPR.	5	**XTPAXLRH**	

④ Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

IP65 Rotary Handle Mechanism

Table 34-191. IP65 Rotary Handle Mechanism ①②③

	Description	Pkg. Qty.	Catalog Number	Price U.S. $ ④
Complete Kits — Includes Handle, Shaft, and Required Hardware				
	Rotary Handle Mech IP65 Black — For use on main switches to IEC/EN 60204.	1	**XTPAXRHMB** ⑤	
	Rotary Handle Mech IP65 Red/Yellow — For use on main switch with Emergency-Stop function to IEC/EN 60204.	1	**XTPAXRHMRY** ⑤	
	Rotary Handle Mech IP65 Black — For use on main switches to IEC/EN 60204 where XTPR is mounted 90° from vertical.	1	**XTPAXRHM90B** ⑤	
	Rotary Handle Mech IP65 Red/Yellow — For use on main switch with Emergency-Stop function to IEC/EN 60204 where XTPR is mounted 90° from vertical.	1	**XTPAXRHM90RY** ⑤	
	Rotary Handle Mech IP65 Black — For use on main switches to IEC/EN 60204.	1	**XTPAXRHM165B**	
	Rotary Handle Mech IP65 Red/Yellow — For use on main switch with Emergency-Stop function to IEC/EN 60204.	1	**XTPAXRHM265RY**	
	Rotary Handle Mech IP65 Black — For use on main switches to IEC/EN 60204 where XTPR is mounted 90° from vertical.	1	**XTPAXRHM365B**	
	Rotary Handle Mech IP65 Red/Yellow — For use on main switch with Emergency-Stop function to IEC/EN 60204 where XTPR is mounted 90° from vertical.	1	**XTPAXRHM465RY**	
Separate Parts				
	Rotary Handle Only IP65 Black — For use on main switches to IEC/EN 60204.	10	**XTPAXRHB10** ⑤	
	Rotary Handle Only IP65 Red/Yellow — For use on main switch with Emergency-Stop function to IEC/EN 60204.	10	**XTPAXRHRY10** ⑤	
	Rotary Handle Only IP65 Black — For use on main switches to IEC/EN 60204 where XTPR is mounted 90° from vertical.	10	**XTPAXRH90B10** ⑤	
	Rotary Handle Only IP65 Red/Yellow — For use on main switch with Emergency-Stop function to IEC/EN 60204 where XTPR is mounted 90° from vertical.	10	**XTPAXRH90RY10** ⑤	
	Shaft Only — Includes Shaft and required hardware to mount to XTPR, 175 mm length.	10	**XTPAXRHMSFT**	
	Shaft Only — Includes Shaft and required hardware to mount to XTPR, 72 mm length, Bulk Pack of 50 pcs.	50	**XTPAXRHMSFTB72**	
	Shaft Only — Includes Shaft and required hardware to mount to XTPR, 98 mm length, Bulk Pack of 50 pcs.	50	**XTPAXRHMSFTB98**	
	Shaft Only — Includes Shaft and required hardware to mount to XTPR, 175 mm length, Bulk Pack of 50 pcs.	50	**XTPAXRHMSFTB175**	

① Plug-in connection shafts, XTPAXRHMSFT_ can be cut to desired length for mounting depths of 100 – 240 mm. Carrier with extension shaft included.
② With ON/OFF switch position and "+" (tripped), lockable with 3 padlocks, 4 – 8 mm hasp. Can be locked in the ON position, if required.
③ Rotary Handle Mechanisms ship with door interlock disables. See instruction publication with product for how to enable door interlock.
④ Orders must be placed in multiples of package quantity listed.
⑤ New design — contact Eaton for availability.

Telescopic Adapter ⑥

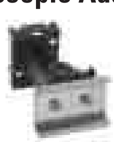


Table 34-192. Telescopic Adapter

Description	Pkg. Qty.	Catalog Number	Price U.S. $
Telescoping Adapter, 75 – 115 mm Depth, for use with XTPB and B-Frame XTPR MMPs	1	**XTPAXTEA**	

⑥ With 45 mm top-hat rail to IEC/EN 60715 for compensation of the mounting depth of rear mounted devices in surface mounted enclosures. Stepless adjustment via scale from 75 – 115 mm.

Sealing Facility

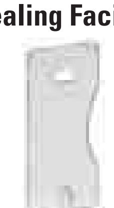


Table 34-193. Sealing Facility

Description	Pkg. Qty.	Catalog Number	Price U.S. $ ⑦
To prevent tampering with the overload release and the test function. It can be sealed using industry standard sealing wire. For use with XTPR manual motor protectors.	5	**XTPAXSW**	

⑦ Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

Three-Phase Commoning Links



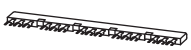
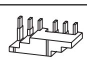
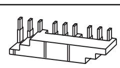
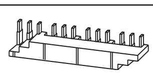
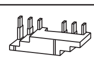
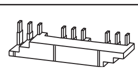
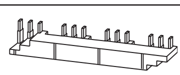
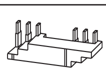
Frame B



Frame D

For parallel power feed to several manual motor protectors on terminals 1, 3 and 5.

Table 34-194. Three-Phase Commoning Links ①

	For Use with…	Qty. MMP	Length of Link (mm)	Unit Width (mm)	Pkg. Qty.	Catalog Number	Price U.S. $ ②
Frame B							
	MMP with no side mounted auxiliaries or voltage releases	2	90	45	10	**XTPAXCLKA2**	
		3	135	45	10	**XTPAXCLKA3**	
		4	180	45	10	**XTPAXCLKA4**	
		5	225	45	10	**XTPAXCLKA5**	
	Each MMP with one auxiliary contact or trip-indicating auxiliary contact fitted on the right	2	99	45 + 9	10	**XTPAXCLKB2**	
		3	153	45 + 9	10	**XTPAXCLKB3**	
		4	207	45 + 9	10	**XTPAXCLKB4**	
		5	261	45 + 9	10	**XTPAXCLKB5**	
	Each MMP with an auxiliary contact and trip-indicating auxiliary contact mounted on the right or a voltage release mounted on the left.	2	108	45 + 18	10	**XTPAXCLKC2**	
		4	234	45 + 18	10	**XTPAXCLKC4**	
Frame D							
	MMP with no side mounted auxiliaries or voltage releases	2	110	55	1	**XTPAXCLKA2D**	
		3	165	55	1	**XTPAXCLKA3D**	
		4	220	55	1	**XTPAXCLKA4D**	
	Each MMP with one auxiliary contact or trip-indicating auxiliary contact fitted on the right	2	119	55 + 9	1	**XTPAXCLKB2D**	
		3	183	55 + 9	1	**XTPAXCLKB3D**	
		4	247	55 + 9	1	**XTPAXCLKB4D**	
	Each MMP with an auxiliary contact or trip-indicating auxiliary contact mounted on the right or a voltage release mounted on the left.	2	128	55 + 18	1	**XTPAXCLKC2D**	
		4	274	55 + 18	1	**XTPAXCLKC4D**	

① Protected against accidental contact. B-Frame short circuit proof U_e = 690V, I_u = 63A; D-Frame short circuit proof U_e = 690V, I_u = 128A. Frame B links can be combined by rotating mounting. Frame D links cannot be combined.

② Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

Shroud for Unused Commoning Link Terminals

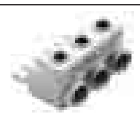
Table 34-195. Shroud for Unused Terminals of Three-Phase Commoning Links

	For Use with…	Description	Pkg. Qty.	Catalog Number	Price U.S. $ ①
	B-Frame XTPR	To cover unused terminals on three-phase commoning link. Protected against direct contact.	20	**XTPAXUTS**	
	D-Frame XTPR		10	**XTPAXUTSD**	

① Orders must be placed in multiples of package quantity listed.

Incoming Terminal for Three-Phase Commoning Link ②

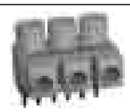
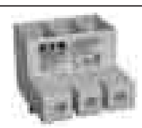
Table 34-196. Incoming Terminal

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ③
	B-Frame XTPR, XTPB	5	**XTPAXIT**	

② For three-phase commoning link, protected against accidental contact, U_e = 690V, I_u = 63A; For conductor cross-sections: 2.5 – 25 mm^2 stranded; 2.5 – 16 mm^2 flexible with ferrules, AWG 14-6.
③ Orders must be placed in multiples of package quantity listed.

Line-Side Adapter ④

Table 34-197. Line-Side Adapter

	For Use with…	Pkg. Qty.	Catalog Number	Price U.S. $ ⑤
	B-Frame XTPR to create a UL 508 Type E/F Manual Combination Starter	5	**XTPAXLSA**	
	D-Frame XTPR to create a UL 508 Type E/F Manual Combination Starter	1	**XTPAXLSAD** ⑥	

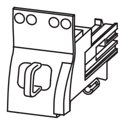
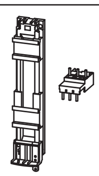
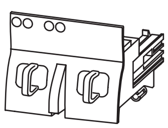
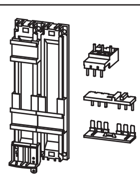
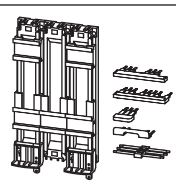
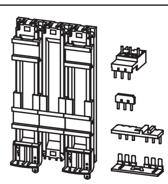
④ XTPAXLSA is for three-phase commoning link, finger- and back-of-hand proof, U_e = 690V, I_u = 60A for conductor cross sections: 2.5 – 25 mm^2 stranded, 2.5 – 16 mm^2 flexible with ferrule, AWG 14-6.
⑤ Orders must be placed in multiples of package quantity listed.
⑥ XTPAXLSAD cannot be combined with three-phase commoning links.

Discount Symbol **1CD7**

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Combination Connection Kits

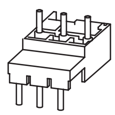
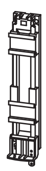
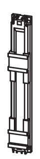
Table 34-198. Combination Connection Kits

	For Use with…	Description	Std. Pack	Catalog Number	Price U.S. $
Non-reversing Starters					
	XTPR...B + XTCE...B	Comprised of: ■ Mechanical connection element for XTPR...B and contactor ■ Main current wiring between XTPR...B and contactor in tool-less plug connection ■ Cable guidance Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. 6 cables up to 2.5 mm^2 external diameter or 4 cables up to 3.5 mm^2 external diameter.	1	**XTPAXTPCB**	
	XTPR...B + XTCE...C	Comprised of: ■ DIN rail adapter plate ■ Main current wiring between XTPR and contactor	1	**XTPAXTPCC**	
	XTPR...D + XTCE...D		1	**XTPAXTPCD**	
Reversing Starters					
	XTPR...B + XTCE...B01_	Comprised of: ■ Mechanical connection element for XTPR...B and contactor ■ Reversing starter main current wiring in tool-less plug connection ■ Control cables for electrical interlocking in tool-less plug connection: – K1M: A1 – K2M: 21 – K1M: 21 – K2M: A1 – K1M: A2 – K2M: A2 ■ Cable guidance Use contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. 6 cables up to 2.5 mm^2 external diameter or 4 cables up to 3.5 mm^2 external diameter.	1	**XTPAXTPCRB**	
	XTPR...B + XTCE...C	Comprised of: ■ DIN rail adapter plate ■ Reversing starter main current wiring	1	**XTPAXTPCRC**	
Star-Delta Starter Sets					
	XTPR...B + XTCE...B	Comprised of: ■ DIN rail adapter plate ■ Main current wiring between XTPR...B and contactor ■ Electrical interlock between delta and star contactor ■ Use as contactor auxiliary switch XTCEXFAT_	1	**XTPAXSDSB**	
	XTPR...B + XTCE...C	Comprised of: ■ DIN rail adapter plate ■ Main current wiring between XTPR...B and contactor	1	**XTPAXSDSC**	

Discount Symbol **1CD7**

Combination Connection Kits

Table 34-198. Combination Connection Kits (Continued)

	For Use with…	Description	Std. Pack	Catalog Number	Price U.S. $ ①
Electrical Connection Module					
	XTPR...B + XTCE...C	Comprised of: ■ Main current wiring between XTPR...B and contactor ■ Use only in combination with busbar adapter	5	**XTPAXECMC**	
	XTPR...D + XTCE...D	Comprised of: ■ Main current wiring between XTPR...D and contactor ■ Use only in combination with busbar adapter	5	**XTPAXECMD**	
DIN Rail Adapter Plates					
	XTPAXTPCB XTPAXTPCRB	Comprised of: ■ 45 mm wide adapter plate with one DIN rail ■ Connection element for side-by-side positioning of further plates	4	**XTPAXTPCPB**	
	XTPR...B + XTCE...C XTPAXECMC	Comprised of: ■ 45 mm wide adapter plate with two DIN rails ■ Connection element for side-by-side positioning of further plates	4	**XTPAXTPCRPB**	
	XTPAXECMD XTPR...D + XTCE...C XTPR...D + XTCE...D	Comprised of: ■ 55 mm wide adapter plate with two DIN rails ■ Connection cams for further plates ■ For use with reversing and star-delta starters	4	**XTPAXTPCPD**	
Lateral Module					
	—	■ Can be grouped on the DIN rail adapter ■ Expansion of the mounting width by 9 mm	10	**XTPAXLM**	
Connection Element					
	—	■ For connection of several DIN rail adapters	50	**XTPAXCNE**	

① Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

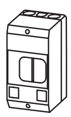
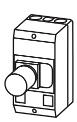
34

Pushbutton MMP Enclosures



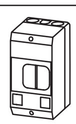
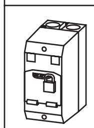
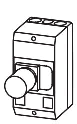
B-Frame

Table 34-199. Insulated Enclosures for Surface Mounting of XTPB Pushbutton Motor-Protective Circuit Breakers — Global Usage ①

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP40 NEMA 1	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXSA..., XTPAXUVR..., XTPAXSR...	—	**XTPBXENCS40**		158 x 80 x 116.5 [6.22 x 3.15 x 4.59]
	IP65 NEMA 3R, 4X, 12, 13		With actuation membrane.	**XTPBXENCS65**		158 x 80 x 116.5 [6.22 x 3.15 x 4.59]
	IP65 NEMA 3R, 4X, 12, 13	XTPB MMP Only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position.	**XTPBXENCSLO65**		158 x 80 x 129.5 [6.22 x 3.15 x 5.10]
	IP65 NEMA 3R, 4X, 12, 13	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXUVR..., XTPAXSR…, XTPAXCL	Lockable in OFF position in combination with XTPBXFAEM20 Early Make front mount auxiliary contact	**XTPBXENCSLE65**		158 x 80 x 129.5 [6.22 x 3.15 x 5.10]
	IP65 NEMA 3R, 4X, 12, 13		With Emergency-Stop (E-Stop) pushbutton actuator, Red-Yellow	**XTPBXENCSES65**		158 x 80 x 177.2 [6.22 x 3.15 x 6.98]
	IP65 NEMA 3R, 4X, 12, 13		With Emergency-Stop (E-Stop) pushbutton actuator, Red-Yellow key release	**XTPBXENCSEK65**		158 x 80 x 177.2 [6.22 x 3.15 x 6.98]

① Integrated terminal for PE(N) connection, two M25 cable entry knockouts at top and at bottom.

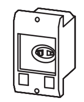
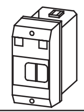
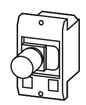
Table 34-200. Insulated Enclosures for Surface Mounting of XTPB Pushbutton Manual Motor Protectors — North American Usage ②③

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP41 NEMA 1	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXSA..., XTPAXUVR..., XTPAXSR…, XTPAXCL	—	**XTPBXENAS41**		158 x 80 x 116.5 [6.22 x 3.15 x 4.59]
	IP65 NEMA 3R, 4X, 12, 13		With actuating diaphragm	**XTPBXENAS65**		158 x 80 x 116.5 [6.22 x 3.15 x 4.59]
	IP65 NEMA 3R, 4X, 12, 13	XTPB MMP Only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position	**XTPBXENASLO65**		158 x 80 x 129.5 [6.22 x 3.15 x 5.10]
	IP65 NEMA 3R, 4X, 12, 13	XTPB MMP Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXUVR..., XTPAXSR…, XTPAXCL	Lockable in OFF position in combination with XTPBXFAEM20 Early Make front mount auxiliary contact.	**XTPBXENASLE65**		158 x 80 x 129.5 [6.22 x 3.15 x 5.10]
	IP65 NEMA 3R, 4X, 12, 13		With Emergency-Stop (E-Stop) pushbutton actuator, Red-Yellow	**XTPBXENASES65**		158 x 80 x 177.2 [6.22 x 3.15 x 6.98]
	IP65 NEMA 3R, 4X, 12, 13		With Emergency-Stop (E-Stop) pushbutton actuator, Red-Yellow key release	**XTPBXENASEK65**		158 x 80 x 177.2 [6.22 x 3.15 x 6.98]

② Built-in terminal for PE(N).
③ North American enclosures come with conduit adapters for use with 1/2" NPT.

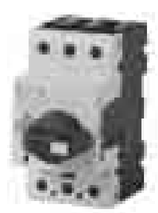
Dimensions .... **Page 34-168**
Discount Symbol **1CD7**

Table 34-201. Insulated Enclosures for Flush Mounting of XTPB Pushbutton Manual Motor Protectors — Global and North American Usage ①

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	Front IP40 NEMA 1	XTPB Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	—	**XTPBXENCF40**		129 x 90.2 x 115.2 [5.08 x 3.55 x 4.54]
	Front IP65 NEMA 3R, 4X, 12, 13		With actuation membrane	**XTPBXENCF55**		129 x 90.2 x 115.2 [5.08 x 3.55 x 4.54]
	Front IP65 NEMA 3R, 4X, 12, 13	XTPB Only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position	**XTPBXENCFLO55**		129 x 90.2 x 115.2 [5.08 x 3.55 x 4.54]
	Front IP65 NEMA 3R, 4X, 12, 13	XTPB Only or with: XTPAXFA…, XTPBXFAEM20, XTPAXUVR…, XTPAXSR…, XTPAXCL	Lockable in OFF position in combination with XTPBXFAEM20 Early Make front mount auxiliary contact	**XTPBXENCFLE55**		129 x 90.2 x 115.2 [5.08 x 3.55 x 4.54]
	Front IP65 NEMA 3R, 4X, 12, 13		With Emergency-Stop (E-Stop) pushbutton actuator	**XTPBXENCFES55**		129 x 90.2 x 175.9 [5.08 x 3.55 x 6.93]
	Front IP65 NEMA 3R, 4X, 12, 13		With Emergency-Stop (E-Stop) pushbutton actuator, key release	**XTPBXENCFEK55**		129 x 90.2 x 175.9 [5.08 x 3.55 x 6.93]

① Integrated terminal for PE(N) connection.

Rotary MMP Enclosures

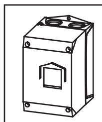
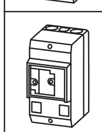
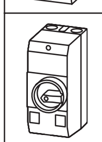


B-Frame



D-Frame

Table 34-202. Insulated Enclosures for Surface Mounting of B-Frame (0.1 – 32A) XTPR Rotary Motor-Protective Circuit Breakers — Global Usage

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP41 with vertical mounting	B-Frame XTPR Only or with: XTPAXFA…, XTPAXSA…, XTPAXSATR…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Cover with aperture dimensioned to accommodate front of MMP. IP40, when mounted turned through 90° to left/right	**XTPAXENCS41** ②		160 x 100 x 104 [6.30 x 3.94 x 4.09]
	IP65		With black/grey rotary handle	**XTPAXENCS65B** ②		160 x 100 x 130 [6.30 x 3.94 x 5.12]
	IP65		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/ EN 60204	**XTPAXENCS65RY** ②		160 x 100 x 130 [6.30 x 3.94 x 5.12]
	IP40	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Cover with aperture dimensioned to accommodate front of MMP.	**XTPAXENCS40** ③		158 x 80 x 100 [6.22 x 3.15 x 3.94]
	IP55	B-Frame XTPR Only or with: XTPAXFA…, XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	**XTPAXENCS55B** ③		158 x 80 x 125.5 [6.22 x 3.15 x 4.94]
	IP55		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/ EN 60204	**XTPAXENCS55RY** ③		158 x 80 x 125.5 [6.22 x 3.15 x 4.94]

② M25 metric cable entry knock-out, top and bottom. Cable push-through membrane, top and bottom, in the back plate and as a control line entry. Includes N and PE terminals.
③ Integrated terminal for PE(N) connection, two M25 cable entry knockouts at the top and bottom.

Discount Symbol **1CD7**

Table 34-203. Insulated Enclosures for Surface Mounting of B-Frame (0.1 – 32A) XTPR Rotary Manual Motor Protectors — North American Usage ①

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP55 NEMA 1, 12, 3R	B-Frame XTPR Only or with: XTPAXSA…and XTPAXFA…, XTPAXUVR…and XTPAXFA…, XTPAXSR…and XTPAXFA…, XTPAXCL	With black/gray rotary handle	XTPAXENAS55B		160 x 100 x 130 [6.30 x 3.94 x 5.12]
			With red/yellow rotary handle for use as Emergency-Stop switch to VDE 0113	XTPAXENAS55RY		160 x 100 x 130 [6.30 x 3.94 x 5.12]

① Built-in N and PE terminal, lower part without knockouts.

Table 34-204. Insulated Enclosures for Surface Mounting of B-Frame XTPR (0.1 – 32A) Rotary Motor-Protective Circuit Breakers with XTPAXFAEM20 Early-Make Front Mount Auxiliary Contact — Global Usage

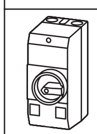
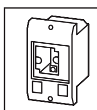
	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP65	B-Frame XTPR and XTPAXFAEM20 only or with: XTPAXFA…, XTPAXSA…, XTPAXSATR…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	XTPAXENCSEM65B		160 x 100 x 130 [6.30 x 3.94 x 5.12]
	IP65		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	XTPAXENCSEM65RY		160 x 100 x 130 [6.30 x 3.94 x 5.12]
	IP55	B-Frame XTPR and XTPAXFAEM20 only or with: XTPAXFA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	XTPAXENCSEM55B		158 x 80 x 100 [6.22 x 3.15 x 3.94]
	IP55		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	XTPAXENCSEM55RY		158 x 80 x 100 [6.22 x 3.15 x 3.94]

Table 34-205. Insulated Enclosures for Surface Mounting of B-Frame XTPR (0.1 – 32A) Rotary Manual Motor Protectors with XTPAXFAEM20 Early-Make Front Mount Auxiliary Contact — North American Usage ②

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP55 NEMA 1, 12, 3R	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXCL	With black/grey rotary handle	XTPAXENASEM55B		160 x 100 x 130 [6.30 x 3.94 x 5.12]
			With red/yellow rotary handle for use as Emergency-Stop switch to VDE 0113	XTPAXENASEM55RY		160 x 100 x 130 [6.30 x 3.94 x 5.12]

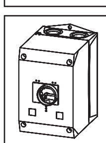
② Built-in N and PE terminal, lower part without knockouts.

Table 34-206. Insulated Enclosures for Flush Mounting of B-Frame (0.1 – 32A) XTPR Rotary Manual Motor Protectors — Global Usage ③

	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	Front IP40	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXCL	Cover with aperture dimensioned to accommodate front of MMP.	XTPAXENCF40		129 x 85 x 96 [5.08 x 3.35 x 3.78]
	Front IP55	B-Frame XTPR Only or with: XTPAXSA…, XTPAXUVR…, XTPAXSR…, XTPAXFA…, XTPAXCL	With black/gray rotary handle	XTPAXENCF55B		129 x 85 x 124 [5.08 x 3.35 x 4.88]
			With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	XTPAXENCF55RY		129 x 85 x 124 [5.08 x 3.35 x 4.88]

③ Integrated terminal for PE(N) connection.

Table 34-207. Insulated Enclosures for Surface Mounting of D-Frame (10 – 32A) Rotary Motor-Protective Circuit Breakers ④⑤

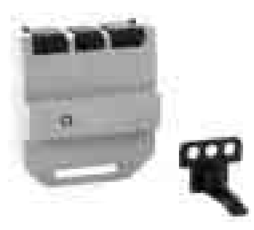
	Degree of Protection	For Use with…	Description	Catalog Number	Price U. S. $	Approx. Dimensions mm [in] H x W x D
	IP65 NEMA 1, 12, 3R	D-Frame XTPR Only or with: XTPAXFA…, XTPAXFAEM20, XTPAXSA…, XTPAXSATR…, XTPAXUVR…, XTPAXSR…, XTPAXCL	With black/gray rotary handle	XTPAXENCSD65B		240 x 160 x 197 [9.45 x 6.30 x 7.76]
	IP65 NEMA 1, 12, 3R		With red/yellow rotary handle for use as Emergency-Stop switches to IEC/EN 60204	XTPAXENCSD65RY		240 x 160 x 197 [9.45 x 6.30 x 7.76]

④ Integrated terminal for PE(N) connection.
⑤ Metric knockouts:
Top ÷ bottom: M25/M32
In backplate: M25/M32
Control cable entry: M20

Discount Symbol **1CD7**

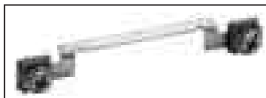
MMP Enclosure Accessories

Table 34-208. XTPR Manual Motor Protector Enclosure Padlock Attachment

	For Use with…	Description	Pkg. Qty.	Catalog Number	Price U. S. $ [1]
	XTPAXENCS65B, XTPAXENCS65RY, XTPAXENCSEM65B, XTPAXENCSEM65RY, XTPAXENCS55B, XTPAXENCS55RY, XTPAXENCSEM55B, XTPAXENCSEM55RY	Padlocking feature. Up to 3 padlocks with 3 – 6 mm hasp thickness. For use as main switch to IEC/EN 60204.	3	**XTPAXPL1** [2]	
	XTPAXENCSD65B, XTPAXENCSD65RY		1	**XTPAXPL2** [2]	
	XTPAXENCF55B, XTPAXENCF55RY		3	**XTPAXPL3** [3]	

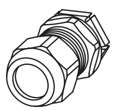
[1] Orders must be placed in multiples of package quantity listed.
[2] Lockable in the 0-position of the XTPR manual motor protector.
[3] Lockable in the OFF position of the B-Frame XTPR manual motor protector.

Table 34-209. Neutral Terminal for use with XTPB and B-Frame XTPR Flush-Mount Enclosures

	For Use with…	Description	Pkg. Qty.	Catalog Number	Price U. S. $ [4]
	**XTPBXENCF40, XTPBXENCF55, XTPAXENCF40, XTPAXENCF55B, XTPAXENCF55RY**	**For connection of a fifth conductor**	20	**XTPAXNT**	

[4] Orders must be placed in multiples of package quantity listed.

Metric Cable Glands to EN 50262



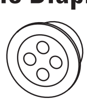
- With locknut and internal strain relief
- IP68 up to 5 bar, hydrogen free

Table 34-210. Metric Cable Glands

Description	Pkg. Qty.	Catalog Number	Price U.S. $ [5]
20.5 mm Metric Cable Gland 6 – 13 mm Wire	20	**XTPAXMCG20**	
25.5 mm Metric Cable Gland 9 – 17 mm Wire	20	**XTPAXMCG25**	
32.5 mm Metric Cable Gland 13 – 21 mm Wire	10	**XTPAXMCG32**	
32.5 mm Metric Cable Gland 18 – 25 mm wire	10	**XTPAXMCG32G**	

[5] Orders must be placed in multiples of package quantity listed.

IP65 Metric Diaphragm Grommet [6]



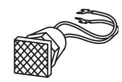
- IP65
- With internal push-through diaphragm

Table 34-211. IP65 Metric Diaphragm Grommet

Description	Pkg. Qty.	Catalog Number	Price U.S. $ [7]
20.5 mm Diaphragm Grommet 1 – 13 mm Wire	100	**XTPAXMDG20**	
25.5 mm Diaphragm Grommet 1 – 18 mm Wire	100	**XTPAXMDG25**	
32.5 mm Diaphragm Grommet 1 – 24 mm Wire	100	**XTPAXMDG32**	

[6] With integral push-through diaphragm.
[7] Orders must be placed in multiples of package quantity listed.

Indicating Lights with Neon Bulb



- For use with XTPR and XTPB enclosures
- Lights do not carry individual IP or NEMA rating. All enclosure ratings remain valid when using indicating lights.

Table 34-212. Indicating Lights

Color	Description — Indicating Light	Pkg. Qty.	Catalog Number	Price U.S. $ [8]
White	110 – 230V 230 – 240V 415 – 500V	10 10 10	**XTPAXILWB** **XTPAXILWN** **XTPAXILWC**	
Green	110 – 230V 230 – 240V 415 – 500V	10 10 5	**XTPAXILGB** **XTPAXILGN** **XTPAXILGC**	
Red	110 – 230V 230 – 240V 415 – 500V	10 10 5	**XTPAXILRB** **XTPAXILRN** **XTPAXILRC**	

[8] Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

34

Technical Data and Specifications

Table 34-213. *XT* Manual Motor Protectors — Technical Data and Specifications

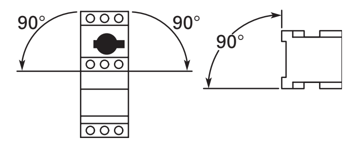
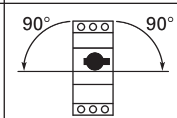
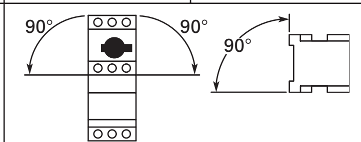
	XTPBP16B – XTPB016B	XTPRP16B – XTPR032B	XTPR016D – XTPR063D	XTPMP16B – XTPM032B	XTPTP16B – XTPT025B
General					
Standards	IEC/EN 60947, VDE 0660, UL 508, CSA C 22.2 No. 14				
Climatic proofing	Damp heat, constant, to IEC 60068-2-78; damp heat, cyclic, to IEC 60068-2-30				
Ambient temperature, °C Storage Open Enclosed	 -25 / 80 -25 / 55 -25 / 40	 -25 / 80 -25 / 55 -25 / 40	 -25 / 70 -25 / 55 -25 / 40	 -25 / 80 -25 / 55 -25 / 40	 -25 / 80 -25 / 55 -25 / 40
Mounting position					
Direction of incoming supply	As required	As required	As required	As required	As required
Degree of protection Device Terminals	 IP20 IP00	 IP20 IP00	 IP20 IP00	 IP20 IP00	 IP20 IP00
Protection against direct contact	Finger- and back-of-hand proof				
Shock resistance half-sinusoidal shock 10 mS to IEC 60068-2-27 (g)	25	25	15	25	25
Altitude (m), maximum	2000	2000	2000	2000	2000
Terminal capacity Solid (mm^2) Flexible with ferrule to DIN 46228, (mm^2) Solid or stranded (AWG)	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10	 1 x (1 – 50) 2 x (1 – 35) 1 x (1 – 35) 2 x (1 – 35) 14 – 2	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10	 1 x (1 – 6) 2 x (1 – 6) 1 x (1 – 6) 2 x (1 – 6) 18 – 10
Terminal screw tightening torque Main cable, Nm Main cable, lb-in Control circuit cable, Nm Control circuit cable, lb-in	 1.7 15.0 1 8.9	 1.7 15.0 1 8.9	 3 26.6 1 8.9	 1.7 15.0 1 8.9	 1.7 15.0 1 8.9
Main contacts					
Rated impulse withstand voltage (U_{imp}), V AC	6000	6000	6000	6000	6000
Overvoltage category / pollution degree	III / 3	III / 3	III / 3	III / 3	III / 3
Rated operational voltage (U_e), V AC	690	690	690	690	690
Rated uninterrupted current = rated operational current ($I_u = I_e$) in amperes	25 or current setting of the overcurrent release	32 or current setting of the overcurrent release	63 or current setting of the overcurrent release	32 or current setting of the overcurrent release	25 or current setting of the overcurrent release
Rated frequency, Hz	40 – 60	40 – 60	40 – 60	40 – 60	40 – 60
Current heat loss (3-pole at operating temperature), W	6	6	22	6	6
Lifespan, mechanical (ops)	50,000	100,000	30,000	100,000	100,000
Lifespan, electrical (AC-3 at 400 V) (ops)	50,000	100,000	30,000	100,000	100,000
Maximum operating frequency, operations/hr	25	40	40	40	40
Short-circuit rating AC	See **Page 34-165**.				
DC (kA)	60	60 (up to XTPR016B) 40 (XTPR020B – XTPR032B)	60	60 (up to XTPM016B) 40 (XTPM020B – XTPR032B)	60 (up to XTPT016B) 40 (XTPT020B – XTPT025B)
Motor switching capacity AC-3 (up to 690 V) in amperes DC-5 (up to 250 V) in amperes	 25 25	 32 25 (3 contacts in series)	 65 63 (3 contacts in series)	 32	 25

Table 34-213. *XT* Manual Motor Protectors — Technical Data and Specifications (Continued)

	XTPBP16B – XTPB016B	XTPRP16B – XTPR032B	XTPR016D – XTPR063D	XTPMP16B – XTPM032B	XTPTP16B – XTPT025B
Releases					
Overload release setting range (x I_u)	0.6 – 1.0	0.6 – 1.0	0.6 – 1.0	—	0.6 – 1.0
Fixed short-circuit release (x I_u)	14	14	14	14	20
Short-circuit release tolerance	± 20%	± 20%	± 20%	± 20%	± 20%
Phase-failure sensitivity	IEC/EN 60947-1-1, VDE 0660 Part 102			—	IEC/EN 60947-1-1, VDE 0660 Part 102
Temperature compensation to IEC/EN 60947, VDE 0660, °C Operating range, °C	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55	 -5 / 40 -25 / 55
Temperature compensation residual error for T > 20°C, %/K	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25	≤ 0.25

Table 34-214. Auxiliary Contacts — Technical Data and Specifications

Description	XTPAXSA_ _	XTPAXFA_ _	XTPA(B)XFAEM_ _	XTPAXSATR_ _
Rated Impulse withstand voltage, U_{imp} (V AC)	6000	4000	4000	6000
Overvoltage category/pollution degree	III/3	III/3	III/3	III/3
Rated operational voltage U_e (VAC) U_e (VDC)	 500 250	 440 250	 440 250	 500 250
Safe isolation to VDE 0106 Part 101 and Part 101/A1 Between auxiliary contacts and main contacts (V AC)	 690	 690	 690	 690
Rated operational current				
AC-15 220 – 240 V, I_e (A) 380 – 415 V, I_e (A) 440 – 500 V, I_e (A)	 3.5 2 1	 1 — —	 1 — —	 3.5 2 1
DC-13 L/R < 100 ms 24 V, I_e (A) 60 V, I_e (A) 110 V, I_e (A) 220 V, I_e (A)	 2 1.5 1 0.25	 2 — — —	 2 — — —	 2 1.5 1 0.25
Lifespan				
Mechanical, operations (x 10^6)	0.1	0.1	0.1	0.01
Electrical, operations (x 10^6)	0.05	0.1	0.1	0.005
Contact reliability (@ U_e = 24V DC, U_{min} – 17V, I_{min} = 5.4 mA, fault probability (λ)	< 10^{-8} < 1 fault at 1 x 10^8 operations			
Positively driven contacts to ZH 1/457	Yes	—	—	—
Short-circuit rating without welding				
Fuseless	FAZ-B4/1-HI	—	—	FAZ-B4/1-HI
Fuse (A gG/gL)	10	10	10	10
Terminal Capacity				
Solid or flexible conductor with ferrule (mm^2)	0.75 –2.5	0.75 – 1.5	0.75 – 1.5	0.75 – 2.5
Solid or stranded (AWG)	18 – 14	18 – 16	18 – 16	18 – 14

Table 34-215. Undervoltage Release — Technical Data and Specifications

Description	XTPAXUVR…
Cross-sections	
Solid or flexible conductor with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or stranded (AWG)	1 x (18 – 14) 2 x (18 – 14)
Main Contacts	
Rated operational voltage, U_e (V AC)	42 – 480
Rated operational voltage, U_e (V DC)	24 – 250
Pick-up voltage, x U_s	0.85 – 1.1
Drop-out voltage, x U_s	0.7 – 0.35
Power Consumption	
Pick-up AC (VA)	5
Sealing AC (VA)	3

Table 34-216. Current Limiter

Description	XTPAXCL
Rated Impulse withstand Voltage (U_{imp}), V AC	6000
Overvoltage Category/ Pollution Degree	III/3
Rated operational voltage, U_e (V AC)	690
Rated interrupted current = Rated operational current ($I_u = I_e$) in amperes	63

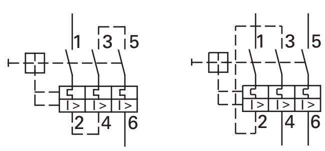


Figure 34-100. XTPB, XTPR 1- and 2-Pole Circuits with DC and AC Current

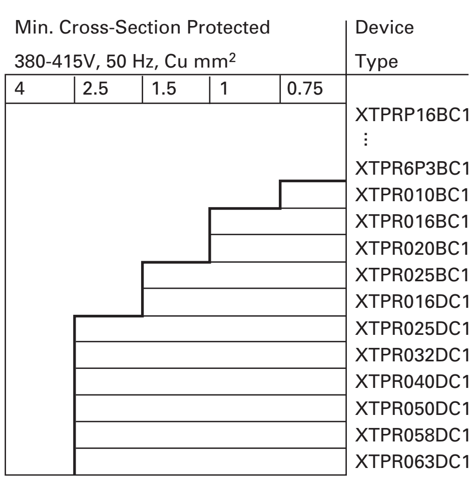


Figure 34-101. Protection of PVC Insulated Cables Against Thermal Overload at Short Circuit

The table indicates which minimum cable cross-sections are protected by XTPR motor protective circuit breakers up to their rated conditional short circuit current Iq.

Table 34-217. Shunt Release — Technical Data and Specifications

Description	XTPAXSR __
Cross-sections	
Solid or flexible conductor with ferrule (mm^2)	1 x (0.75 – 2.5) 2 x (0.75 – 2.5)
Solid or stranded (AWG)	1 x (18 – 14) 2 x (18 – 14)
Main Contacts	
Rated operational voltage, U_e (V AC)	42 – 480
Rated operational voltage, U_e (V DC)	24 – 250
AC Operating Range, x U_s	0.7 – 1.1
DC Operating Range, x U_s (intermittent operation 5s)	0.7 – 1.1
Power Consumption	
Pick-up AC (VA)	5
Sealing AC (VA)	3
Pick-up DC (VA)	3
Sealing DC (VA)	3

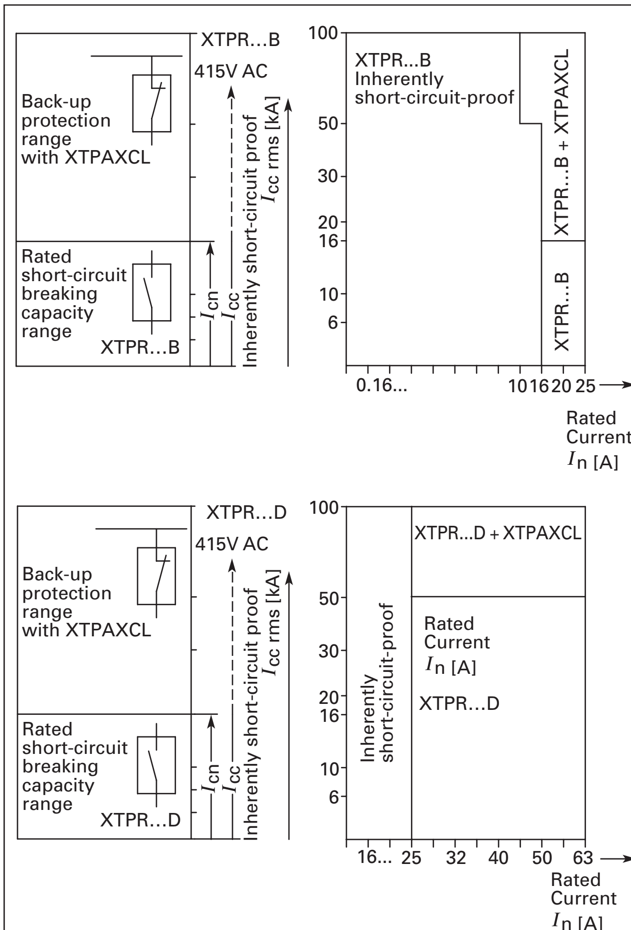


Figure 34-102. Fuseless Installation with XTPR, Back-Up Protection Diagrams

Time/Current Curve

Characteristics

The time/current characteristic, the current limiting characteristics and the I^2t characteristics were determined in accordance with DIN VDE 0660 and IEC 60 947.

The tripping characteristic of the **inverse-time delayed overload releases** (thermal overload releases or "a" releases) for DC and AC with a frequency of 0 to 400 Hz also apply to the time/current characteristic.

The characteristics apply to the cold state. At operating temperature, the tripping times of the thermal releases are reduced to approximately 25%.

Under normal operating conditions, all three poles of the device must be loaded. The three main conducting paths must be connected in series in order to protect single-phase or DC loads.

With 3-pole loading, the maximum deviation in the tripping time for 3 times the setting current and upwards is ±20% and thus in accordance with DIN VDE 0165.

The tripping characteristics for the instantaneous, electromagnetic overcurrent releases (short-circuit releases or "n" releases) are based on the rated current I_n, which is also the maximum value of the setting range for circuit-breakers with adjustable overload releases. If the current is set to a lower value, the tripping current of the "n" release is increased by a corresponding factor.

The characteristics of the electromagnetic overcurrent releases apply to frequencies of 50/60 Hz. Appropriate correction factors must be used for lower frequencies up to 16-2/3 Hz, for higher frequencies up to 400 Hz and for DC.

Time/current characteristics, current limiting characteristics and I^2t characteristics are available on request.

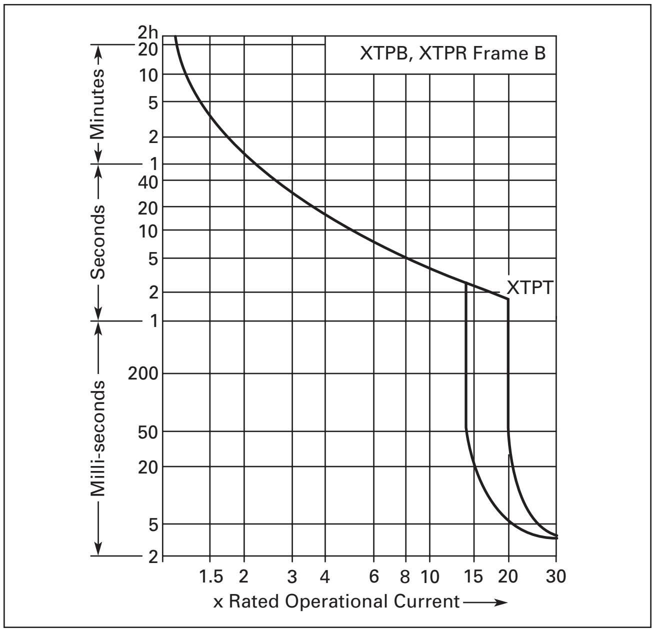


Figure 34-103. MMP Tripping Characteristics — XTPB, XTPR Frame B and XTPT (not for XTPM)

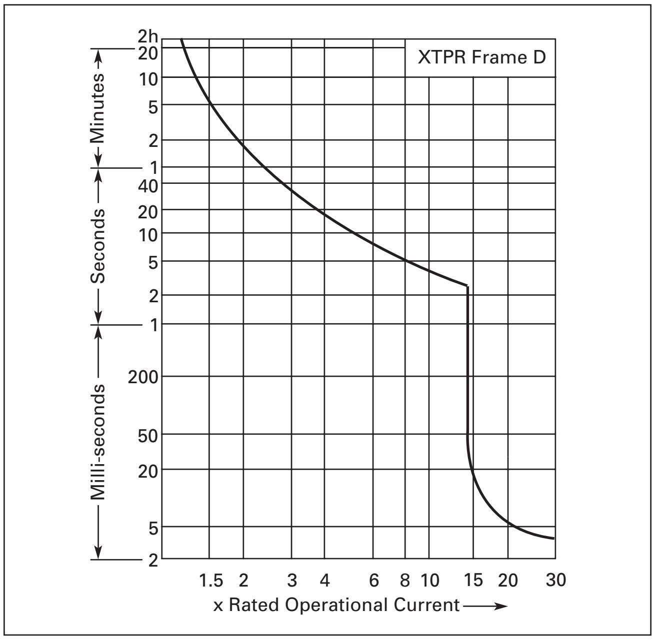


Figure 34-104. MMP Tripping Characteristics — XTPR Frame D

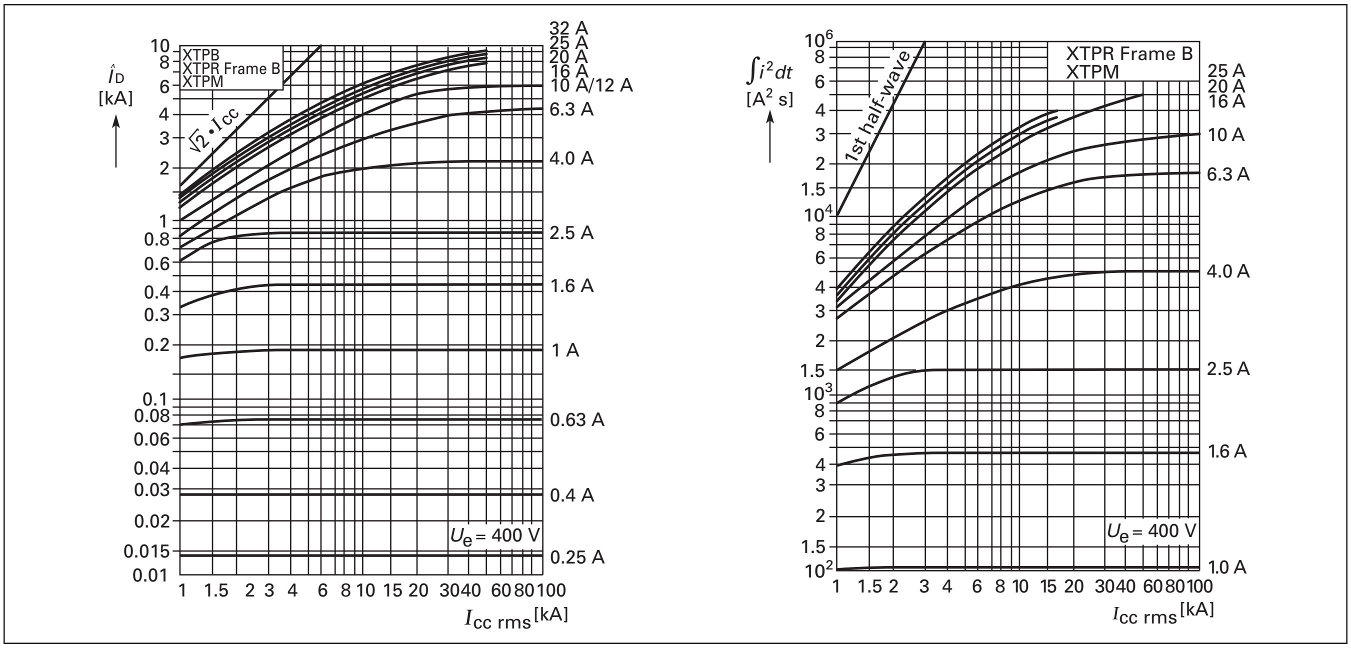


Figure 34-105. MMP Let-Through Tripping Characteristics — XTPB, XTPR Frame B, XTPT, XTPM

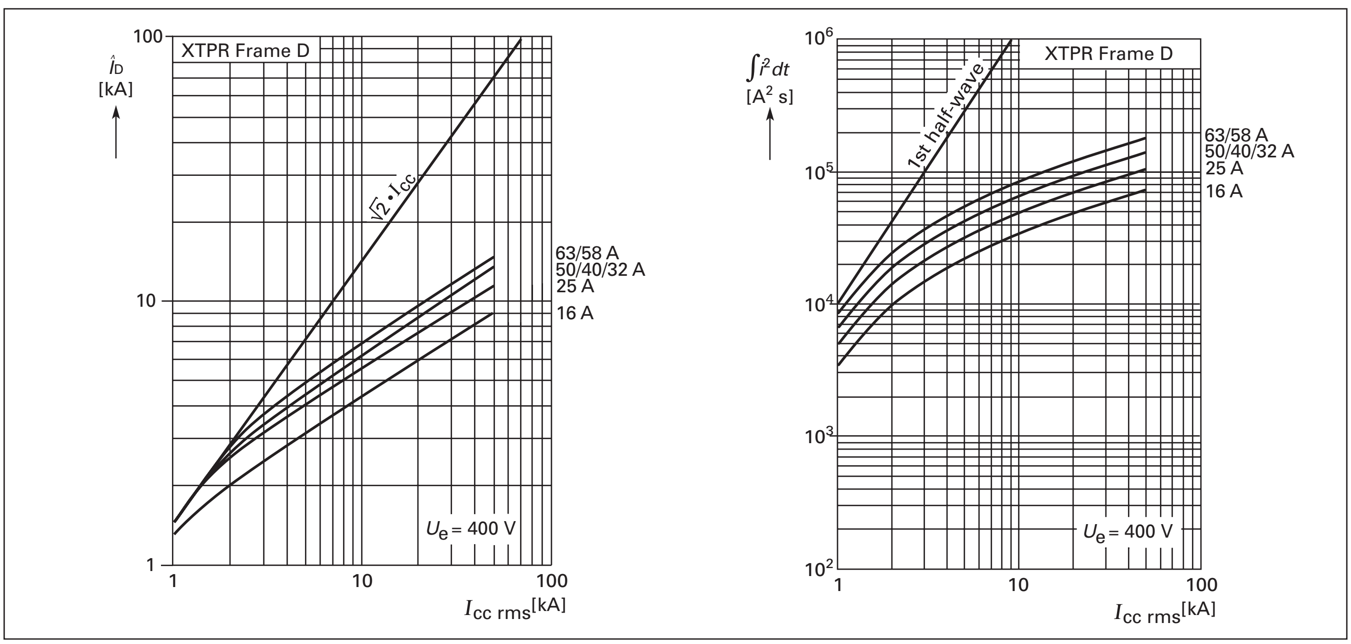


Figure 34-106. MMP Let-Through Tripping Characteristics — XTPR Frame D

Manual Motor Protector Short Circuit Ratings

Rated uninterrupted current I_u = Rated operational current I_e.
Rated conditional short circuit current I_q — IEC/EN 60947-4-1.
Rated ultimate short circuit breaking capacity I_{cu} — IEC/EN 60947-2.
Rated operational short circuit breaking capacity I_{cs} — IEC/EN 60947-2.

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Table 34-218. Manual Motor Protector Short Circuit Ratings — Global Use, IEC/EN 60947

I_u	230V				400V				440V				500V				690V			
	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③	I_q	I_{cu}	I_{cs}	Fuse ②③
A	kA	kA	kA	A	kA	kA	kA	A	kA	kA	kA	A	kA	kA	kA	A	kA	kA	kA	A
XTPB with classification Type "1" and Type "2"																				
0.16 – 1	50	50	50	50	50	50	50	50	50	50	50	50								
1.6	50	50	50	50	50	50	50	50	50	50	50	50								
2.5	50	50	50	50	50	50	50	50	50	50	50	50								
4	50	50	50	50	50	50	50	50	50	50	50	50								
6.3	50	50	50	50	50	50	50	50	50	50	50	50								
10	50	50	50	50	50	50	50	50	42	42	10	50								
12	50	50	10	50	50	50	10	50	15	15	10	50								
16	50	50	10	50	50	50	10	50	15	15	10	50								
20	50	50	10	50	50	50	10	50	10	10	10	50								
25	50	50	10	50	50	50	10	50	10	10	10	50								
XTPR…BC1, XTPT, XTPM with classification Type "1" and Type "2"																				
0.16 – 1	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	N	①	①	①	N	①	①	①	N
1.6	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	N	①	①	①	N	①	①	①	N
2.5	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	N	①	①	①	N	5	5	5	50
4	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	N	①	①	①	N	3	3	3	50
6.3	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	①	①	①	N	42	42	6	50	3	3	2	50
10	150 ①	150 ①	150 ①	N	150 ①	150 ①	150 ①	N	42	42	10	50	42	42	6	50	3	3	2	50
12	50	50	10	50	50	50	10	50	15	15	10	50	15	15	6	50	3	3	2	50
16	50	50	10	50	50	50	10	50	15	15	10	50	15	15	6	50	3	3	2	50
20	50	50	10	50	50	50	10	50	15	15	10	50	6	6	6	50	3	3	2	50
25	50	50	10	50	50	50	10	50	10	10	10	50	6	6	6	50	3	3	2	50
32	50	50	10	50	50	50	10	50	10	10	10	50	6	6	6	50	3	3	2	50
XTPR…DC1 with classification Type "1" and Type "2"																				
16	150 ①	150 ①	25	N	150 ①	150 ①	25	N	45	45	25	100	15	15		100	8	8	2.5	100
25	150 ①	150 ①	25	N	150 ①	150 ①	25	N	45	45	25	100	15	15		100	8	8	2.5	100
32	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
40	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
50	50	50	25	100	50	50	25	100	45	45	25	100	15	15		100	5	5	2.5	100
58	50	50	25	160	50	50	25	160	45	45	25	160	15	15		160	5	5	2.5	160
63	50	50	25	160	50	50	25	160	45	45	25	160	15	15		160	5	5	2.5	160
XTPR…BC1, XTPT, XTPM with Current Limiter XTPAXCL																				
0.16 – 1	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
1.6	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
2.5	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N
4	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N
6.3	①	①	①	N	①	①	①	N	①	①	①	N	①	①	50	N	20	20	20	N
10	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N	20	20	20	N
12	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N	5	5	2.5	N
16	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N	5	5	2.5	N
20	①	①	①	N	①	①	①	N	①	①	①	N	10	10	10	N	5	5	2.5	N
25	①	①	①	N	①	①	①	N	①	①	①	N	10	10	10	N	5	5	2.5	N
32	①	①	①	N	①	①	①	N	①	①	①	N	10	10	10	N	5	5	2.5	N
XTPR…BC1, XTPT, XTPM with (2) Current Limiters XTPAXCL																				
0.16 – 1	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
1.6	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	①	①	20	N
2.5	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	40	40	20	N
4	①	①	①	N	①	①	①	N	①	①	①	N	①	①	①	N	40	40	20	N
6.3	①	①	①	N	①	①	①	N	①	①	①	N	①	①	50	N	20	20	20	N
10	①	①	①	N	①	①	①	N	①	①	①	N	①	①	40	N	20	20	20	N
12	①	①	①	N	①	①	①	N	①	①	①	N	①	①	40	N	10	10	2.5	N
16	①	①	①	N	①	①	①	N	①	①	①	N	①	①	40	N	10	10	2.5	N
20	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N	10	10	2.5	N
25	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N	10	10	2.5	N
32	①	①	①	N	①	①	①	N	①	①	①	N	20	20	20	N	10	10	2.5	N

① No upstream protective device required, as it is the auto-protected range (100/150 kA — Frame B, 150 kA — Frame D).
② N = Not required.
③ XTPR…BC1, XTPT, XTPM — Required back-up fuse if the short circuit current exceeds the rated conditional short circuit current ($I_{cc} > I_q$); XTPB, XTPR...DC1 — Fuse (A gG/gL) for enhancing the switching capacity of the motor protective circuit breaker to 100 kA.

Manual Motor Protectors

Table 34-219. Ratings for Group Motor Applications — UL 508 / CSA C22.2 No. 14

Catalog Number	Rated Uninterrupted Current — I_u (Amps)	FLA Adjustment Range / Overload Release — I_r (Amps)	Short Circuit Release — I_{rm} (Amps)	Maximum Protective Device for UL/CSA Group Protection					
				Max. RMS Sym Current — 600V (kA)		Maximum Fuse Rating (A)		Circuit Breaker Max (A)	
					w/Current Limiter — XTPAXCL		w/Current Limiter — XTPAXCL		w/Current Limiter — XTPAXCL
XTPB — Frame B, Manual Motor Protector with Thermal and Magnetic Trip									
XTPBP16BC1	0.16	0.1 – 0.16	2.2	50	—	600	—	600	—
XTPBP25BC1	0.25	0.16 – 0.25	3.5	50	—	600	—	600	—
XTPBP40BC1	0.4	0.25 – 0.4	5.6	50	—	600	—	600	—
XTPBP63BC1	0.63	0.4 – 0.63	8.8	50	—	600	—	600	—
XTPB001BC1	1	0.63 – 1	14	50	—	600	—	600	—
XTPB1P6BC1	1.6	1 – 1.6	22	50	—	600	—	600	—
XTPB2P5BC1	2.5	1.6 – 2.5	35	50	—	600	—	600	—
XTPB004BC1	4	2.5 – 4	56	50	—	600	—	600	—
XTPB6P3BC1	6.3	4 – 6.3	88	50	—	600	—	600	—
XTPB010BC1	10	6.3 – 10	140	10	50	150	600	125 [2]	600
XTPB012BC1	12	8 – 12	168	10	50	150	600	125 [2]	600
XTPB016BC1	16	10 – 16	224	10 [1]	50 [1]	150 [1]	600 [1]	125 [1][2]	600 [1]
XTPB020BC1 [3]	20	16 – 20	280	10 [1]	18 [1]	150 [1]	600 [1]	125 [1]	600 [1]
XTPB025BC1 [3]	25	20 – 25	350	10 [1]	18 [1]	150 [1]	600 [1]	125 [1]	600 [1]
XTPR — Frame B (all Screw and Spring Cage terminal options), Manual Motor Protector with Thermal and Magnetic Trip									
XTPRP16BC1	0.16	0.1 – 0.16	2.2	50	—	600	—	600	—
XTPRP25BC1	0.25	0.16 – 0.25	3.5	50	—	600	—	600	—
XTPRP40BC1	0.4	0.25 – 0.4	5.6	50	—	600	—	600	—
XTPRP63BC1	0.63	0.4 – 0.63	8.8	50	—	600	—	600	—
XTPR001BC1	1	0.63 – 1	14	50	—	600	—	600	—
XTPR1P6BC1	1.6	1 – 1.6	22	50	—	600	—	600	—
XTPR2P5BC1	2.5	1.6 – 2.5	35	50	—	600	—	600	—
XTPR004BC1	4	2.5 – 4	56	50	—	600	—	600	—
XTPR6P3BC1	6.3	4 – 6.3	88	50	—	600	—	600	—
XTPR010BC1	10	6.3 – 10	140	10	50	150	600	125 [2]	600
XTPR012BC1	12	8 – 12	168	10	50	150	600	125	600
XTPR016BC1	16	10 – 16	224	10	50	150	600	125 [2]	600
XTPR020BC1	20	16 – 20	280	10	18	150	600	125	600
XTPR025BC1	25	20 – 25	350	10	18	150	600	125	600
XTPR032BC1	32	25 – 32	448	10	18	150	600	125	600
XTPR — Frame D, Manual Motor Protector with Thermal and Magnetic Trip									
XTPR016DC1	16	10 – 16	224	10	—	600	—	600	—
XTPR025DC1	25	16 – 25	350	10	—	600	—	600	—
XTPR032DC1	32	25 – 32	448	10	—	600	—	600	—
XTPR040DC1	40	32 – 40	560	10	—	600	—	600	—
XTPR050DC1	50	40 – 50	700	10 [1]	—	600 [1]	—	600 [1]	—
XTPR058DC1	58	50 – 58	812	10 [1]	—	600 [1]	—	600 [1]	—
XTPR063DC1	65	55 – 63	882	10 [1]	—	600 [1]	—	600 [1]	—
XTPT — Frame D, Manual Motor Protector with Thermal and Magnetic Trip									
XTPTP16BC1	0.16	0.1 – 0.16	2.4	50	—	600	—	600	—
XTPTP25BC1	0.25	0.16 – 0.25	4.25	50	—	600	—	600	—
XTPTP40BC1	0.4	0.25 – 0.4	6.8	50	—	600	—	600	—
XTPTP63BC1	0.63	0.4 – 0.63	12	50	—	600	—	600	—
XTPT001BC1	1	0.63 – 1	20	50	—	600	—	600	—
XTPT1P6BC1	1.6	1 – 1.6	32	50	—	600	—	600	—
XTPT2P5BC1	2.5	1.6 – 2.5	50	50	—	600	—	600	—
XTPT004BC1	4	2.5 – 4	84	50	—	600	—	600	—
XTPT6P3BC1	6.3	4 – 6.3	141	50	—	600	—	600	—
XTPT010BC1	10	6.3 – 10	224	10	50	150	600	125 [2]	600
XTPT012BC1	12	8 – 12	224	10	50	150	600	125	600
XTPT016BC1	16	10 – 16	358	10	50	150	600	125	600
XTPT020BC1	20	16 – 20	380	10	18	150	600	125	600
XTPT025BC1	25	20 – 25	420	10	18	150	600	125	600

[1] Rating is pending UL approval. Contact Eaton for availability.
[2] 22kA 600V AC
[3] IEC/EN 60947-4-1

Table 34-220. UL 508 Type E Ratings

Manual Motor Protector — Screw Terminals	Line Side Adapter	FLA Adjustment Range / Overload Release — I_r (Amps)	Short-Circuit Release — I_{rm} (Amps)	UL508 Type F Application				
				Max. RMS Symmetrical Short-Circuit Ratings (kA)			Maximum Upstream Protective Device (A) ①	
Catalog Number	Catalog Number			240V	480/277V	600/347V	Maximum Fuse 600V	Maximum Circuit Breaker 600V
XTPR Frame B + XTPAXLSA								
XTPRP16BB1	**XTPAXLSA**	0.1 – 0.16	2.2	50	50	18	Not Required	Not Required
XTPRP16BC1	**XTPAXLSA**	0.16 – 0.25	3.5	50	50	18	Not Required	Not Required
XTPRP25BC1	**XTPAXLSA**	0.25 – 0.4	5.6	50	50	18	Not Required	Not Required
XTPRP40BC1	**XTPAXLSA**	0.4 – 0.63	8.82	50	50	18	Not Required	Not Required
XTPRP63BC1	**XTPAXLSA**	0.63 – 1	14	50	50	18	Not Required	Not Required
XTPR001BC1	**XTPAXLSA**	1 – 1.6	22.4	50	50	18	Not Required	Not Required
XTPR1P6BC1	**XTPAXLSA**	1.6 – 2.5	35	50	50	18	Not Required	Not Required
XTPR2P5BC1	**XTPAXLSA**	2.5 – 4	56	50	50	18	Not Required	Not Required
XTPR004BC1	**XTPAXLSA**	4 – 6.3	88.2	50	50	18	Not Required	Not Required
XTPR6P3BC1	**XTPAXLSA**	6.3 – 10	140	50	50	18	Not Required	Not Required
XTPR010BC1	**XTPAXLSA**	8 – 12	168	42	42	—	Not Required	Not Required
XTPR012BC1	**XTPAXLSA**	10 – 16	224	42	42	—	Not Required	Not Required
XTPR016BC1	**XTPAXLSA**	10 – 16	224	18	18	—	Not Required	Not Required
XTPR020BC1	**XTPAXLSA**	16 – 20	280	18	18	—	Not Required	Not Required
XTPR025BC1	**XTPAXLSA**	20 – 25	350	18	18	—	Not Required	Not Required
XTPR032BC1	**XTPAXLSA**	25 – 32	448	18	18	—	Not Required	Not Required
XTPR Frame D + XTPAXLSAD								
XTPR016DC1	**XTPAXLSAD**	10 – 16	224	50	50	50	Not Required	Not Required
XTPR025DC1	**XTPAXLSAD**	16 – 25	350	50	50	50	Not Required	Not Required
XTPR032DC1	**XTPAXLSAD**	25 – 32	448	50	50	50	Not Required	Not Required
XTPR040DC1	**XTPAXLSAD**	32 – 40	560	50	50	50	Not Required	Not Required

① For UL508 Type F applications, the Manual Motor Protector assembly does not require a dedicated upstream protective device in the panel, thus a maximum rating is not required.

Dimensions

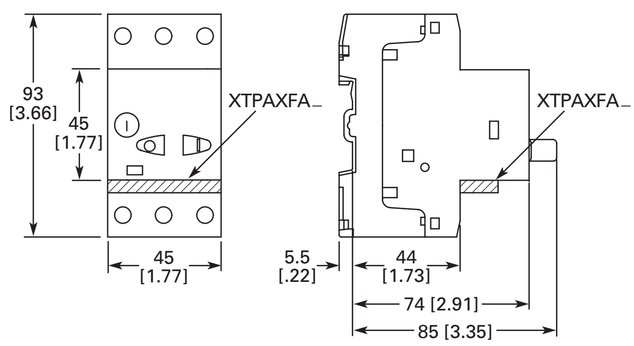


Figure 34-107. Manual Motor Protectors — XTPB (Approximate Dimensions in mm [in])

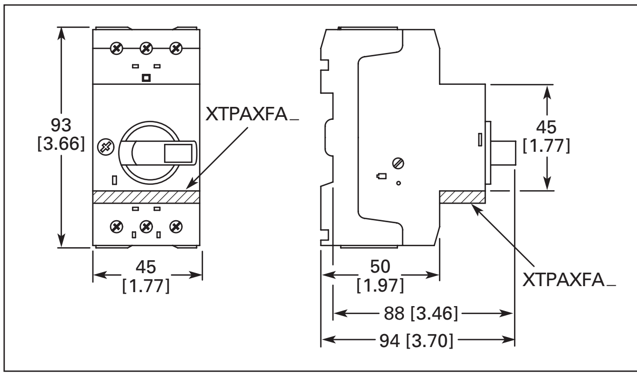


Figure 34-108. Manual Motor Protectors, Manual Transformer Protectors — XTPR…B, XTPT and XTPM (Approximate Dimensions in mm [in])

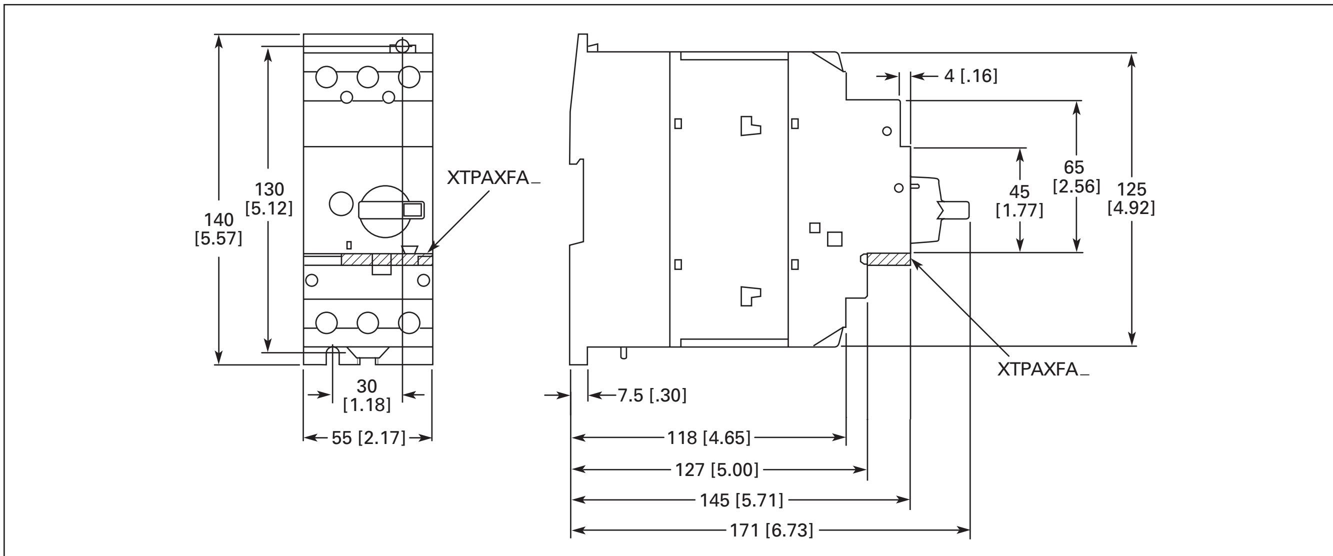


Figure 34-109. Manual Motor Protector — XTPR…DC1 (Approximate Dimensions in mm [in])

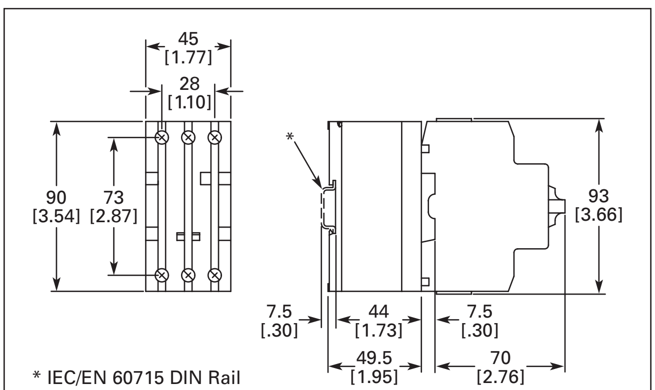


Figure 34-110. Current Limiter — XTPAXCL (Approximate Dimensions in mm [in])

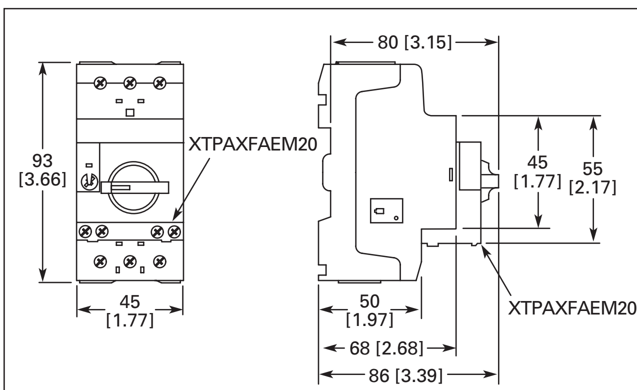


Figure 34-111. MMPs with Early-Make Auxiliary Contacts — XTPR…BC1 + XTPAXFAEM20 (Approximate Dimensions in mm [in])

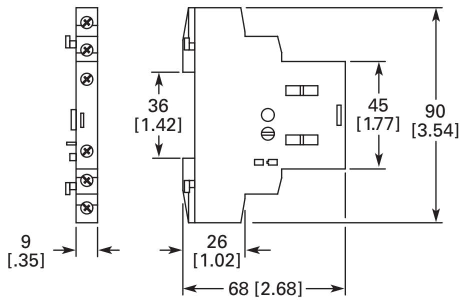


Figure 34-112. Standard Auxiliary Contact — XTPAXSA… (Approximate Dimensions in mm [in])

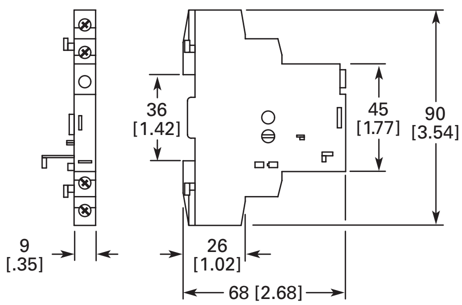


Figure 34-113. Trip Indicating Auxiliary Contact — XTPAXSATR… (Approximate Dimensions in mm [in])

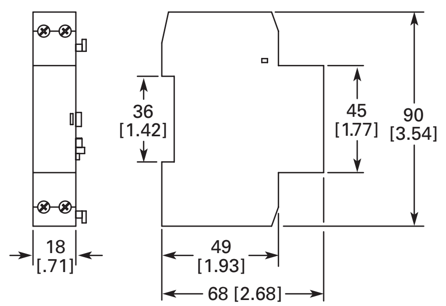


Figure 34-114. Undervoltage / Shunt Release — XTPAXUVR…, XTPAXSR…
(Approximate Dimensions in mm [in])

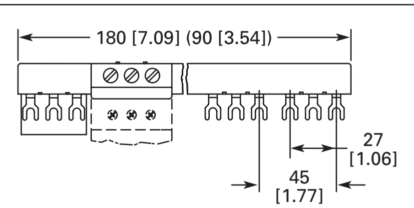


Figure 34-115. Three-Phase Commoning Link — XTPAXCLKA4, XTPAXCLKA2 (Approximate Dimensions in mm [in])

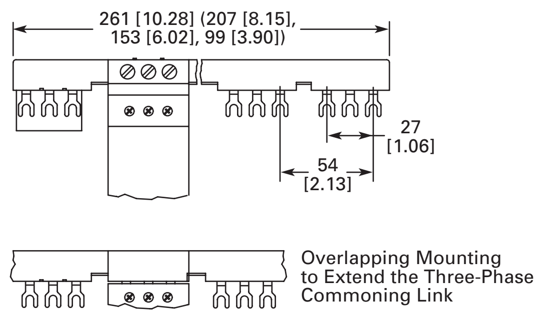


Figure 34-116. Three-Phase Commoning Link — XTPAXCLKB5, XTPAXCLKB4, XTPAXCLKB3, and XTPAXCLKB2 (Approximate Dimensions in mm [in])

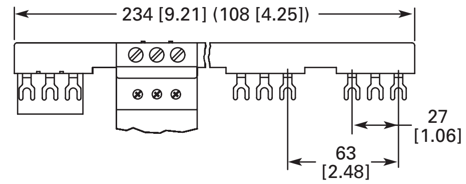


Figure 34-117. Three-Phase Commoning Link — XTPAXCLKC4, XTPAXCLKC2 (Approximate Dimensions in mm [in])

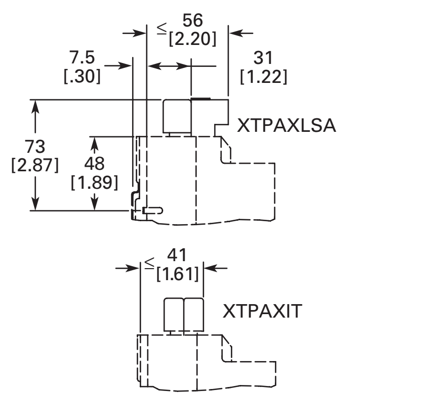


Figure 34-118. Incoming Terminal, Line Side Adapter — XTPAXIT, XTPAXLSA (Approximate Dimensions in mm [in])

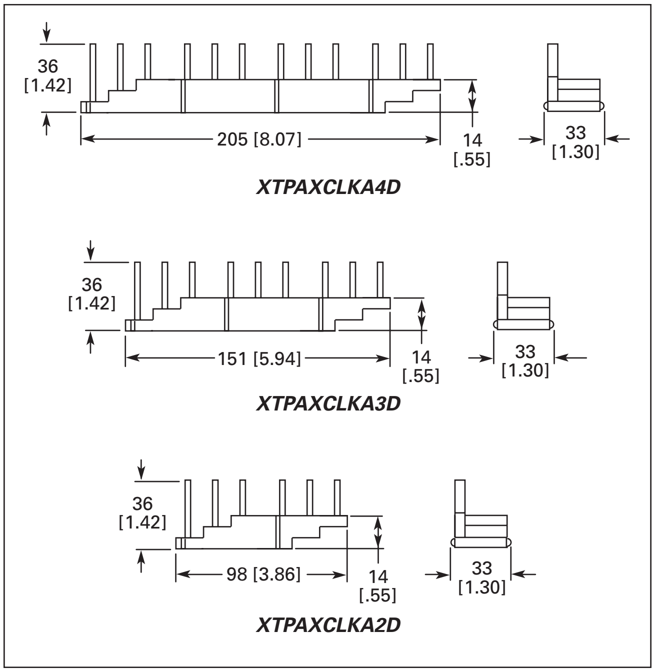


Figure 34-119. Three-Phase Commoning Link — XTPAXCLKA4D, XTPAXCLKA3D and XTPAXCLKA2D (Approximate Dimensions in mm [in])

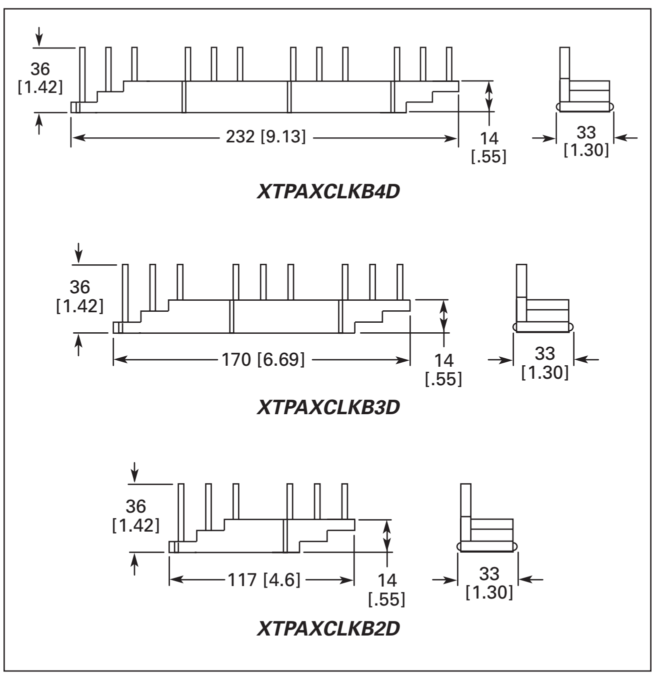


Figure 34-120. Three-Phase Commoning Link — XTPAXCLKB4D, XTPAXCLKB3D and XTPAXCLKB2D (Approximate Dimensions in mm [in])

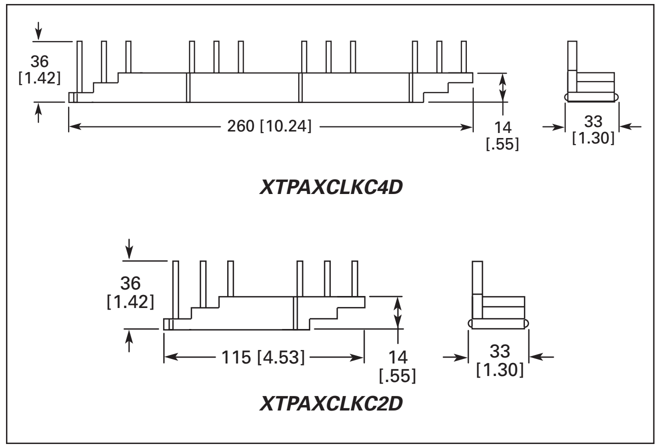


Figure 34-121. Three-Phase Commoning Link — XTPAXCLKC4D and XTPAXCLKC2D (Approximate Dimensions in mm [in])

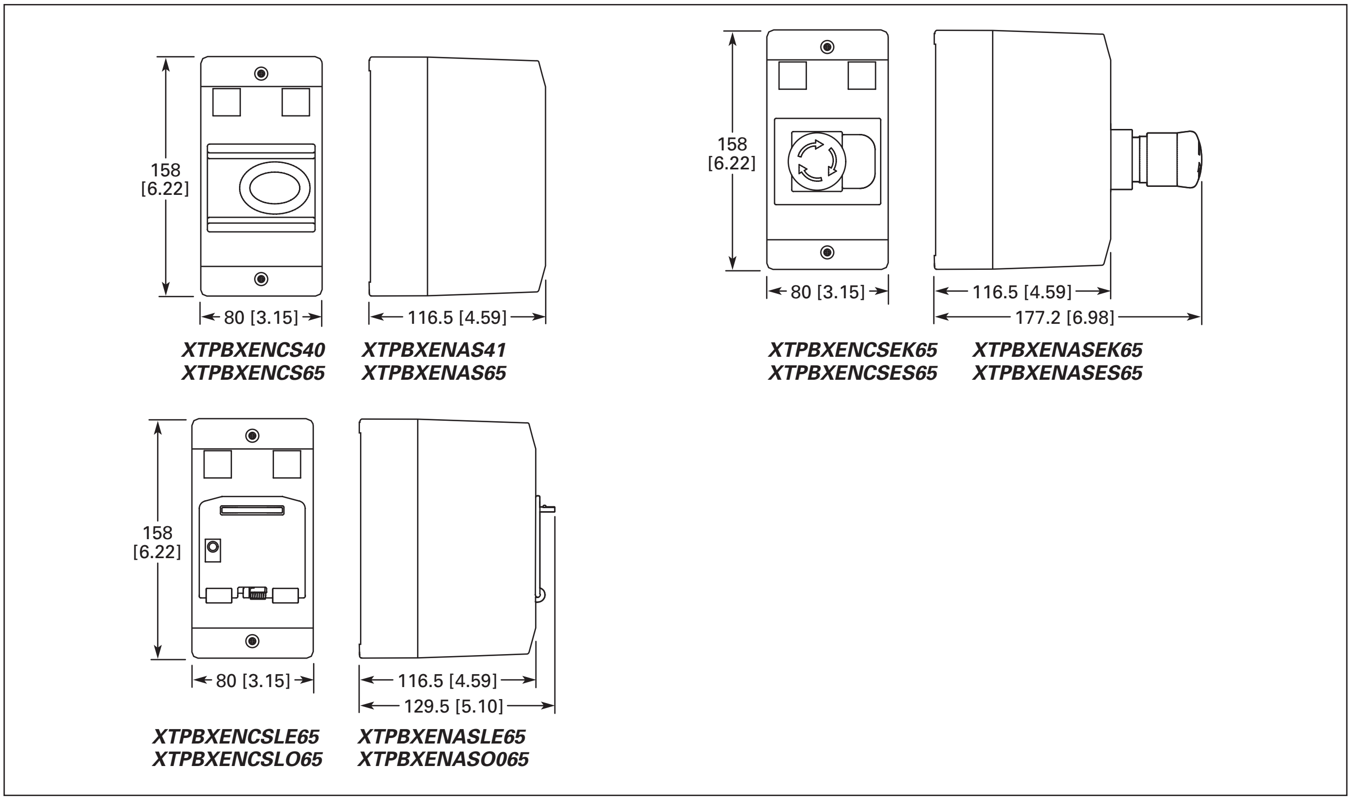


Figure 34-122. Insulated Enclosures for Surface Mounting of XTPB Manual Motor Protectors (Approximate Dimensions in mm [in])

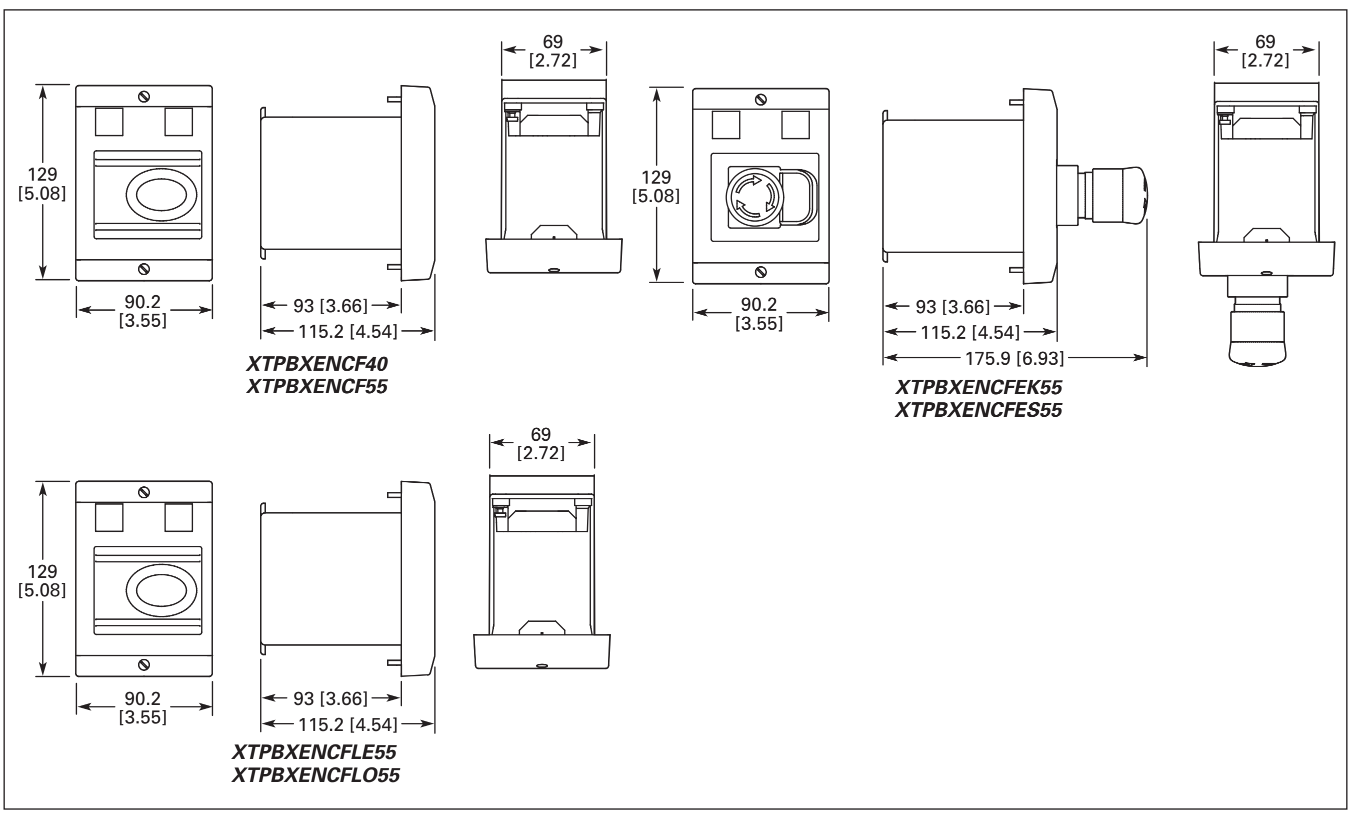


Figure 34-123. Insulated Enclosures for Flush Mounting of XTPB Manual Motor Protectors (Approximate Dimensions in mm [in])

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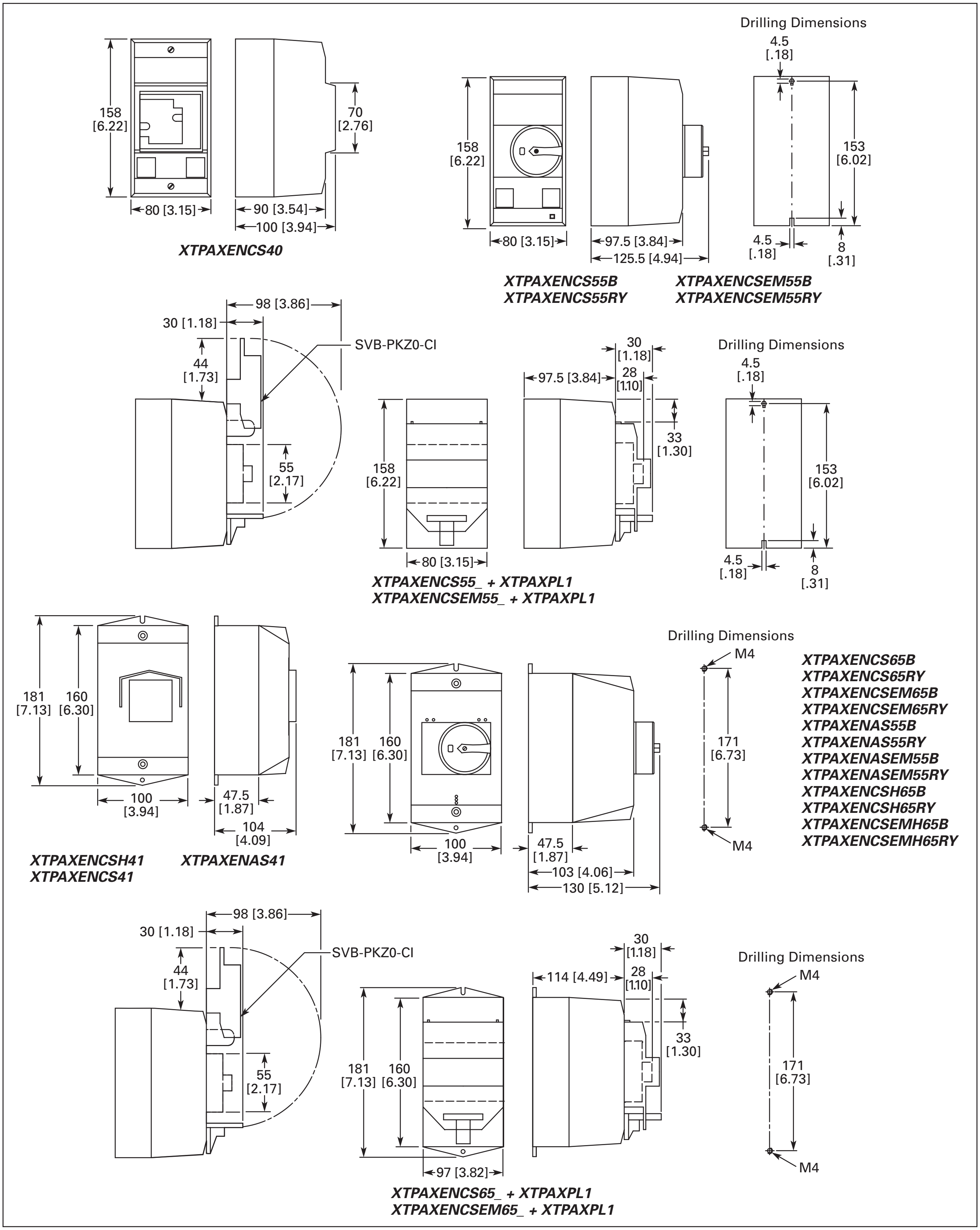


Figure 34-124. Insulated Enclosures for Surface Mounting of XTPR...B Manual Motor Protectors (Approximate Dimensions in mm [in])

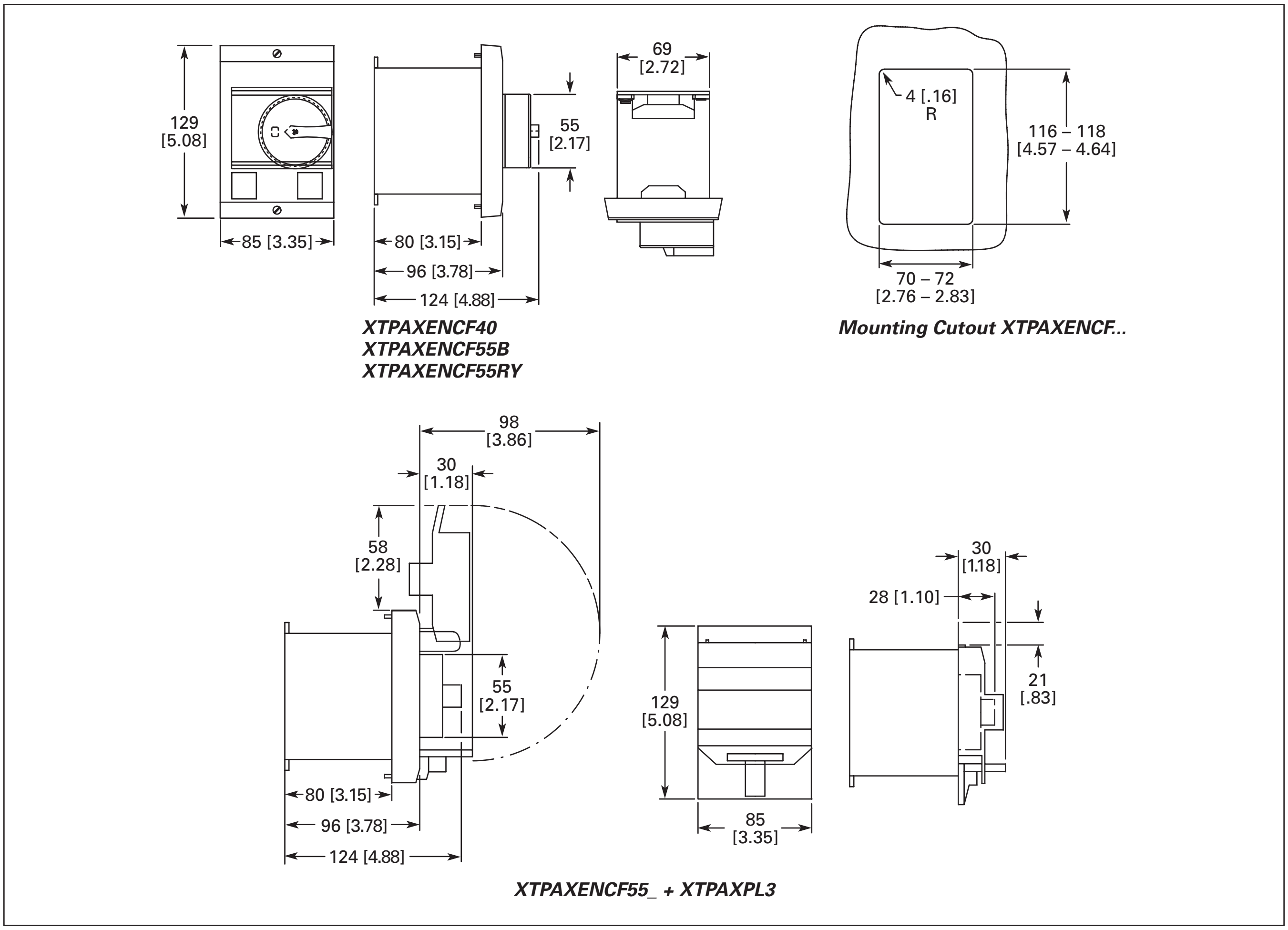


Figure 34-125. Insulated Enclosures for Flush Mounting of XTPR...B Manual Motor Protectors (Approximate Dimensions in mm [in])

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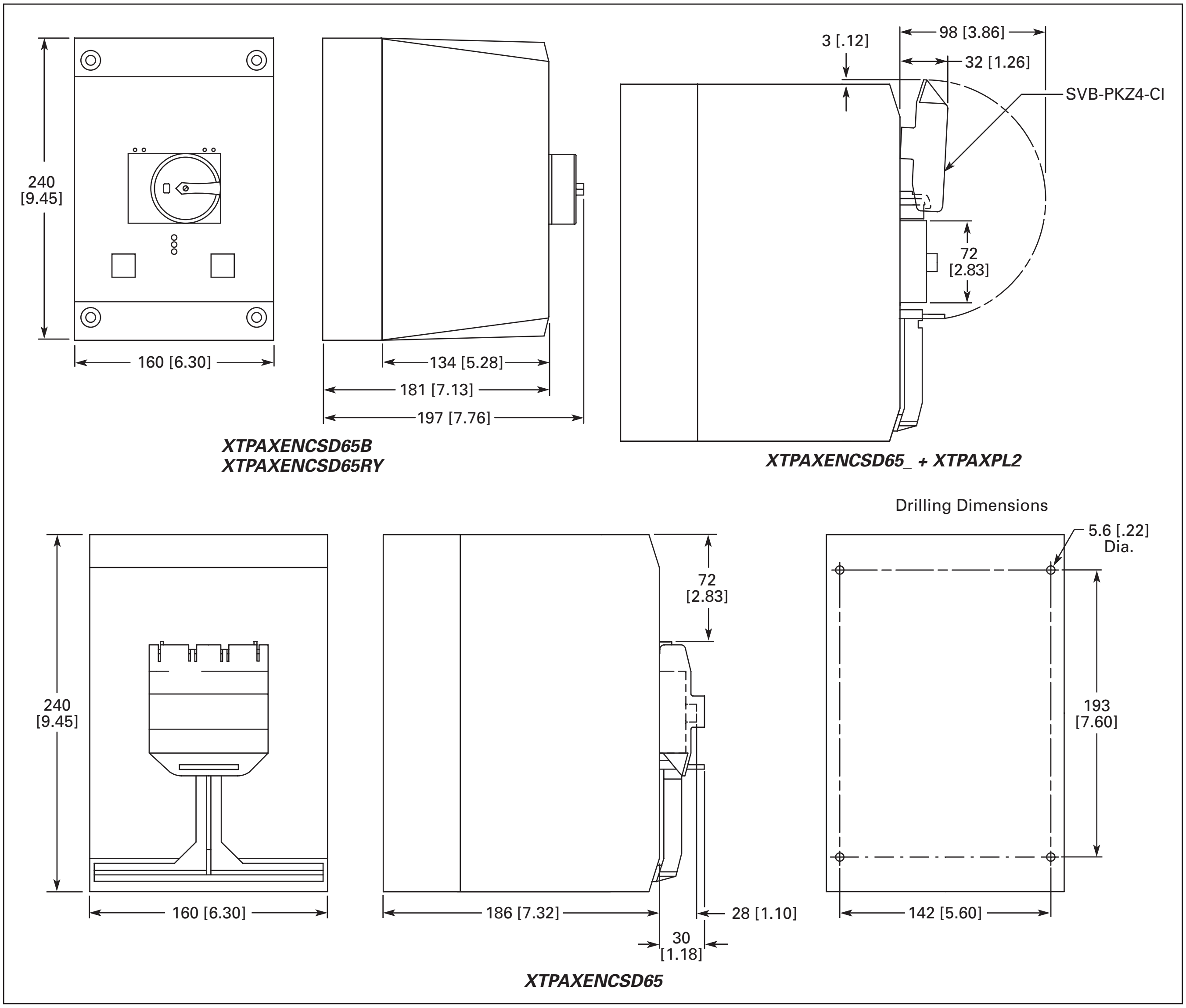


Figure 34-126. Insulated Enclosures for Surface Mounting of XTPR...D Manual Motor Protectors (Approximate Dimensions in mm [in])

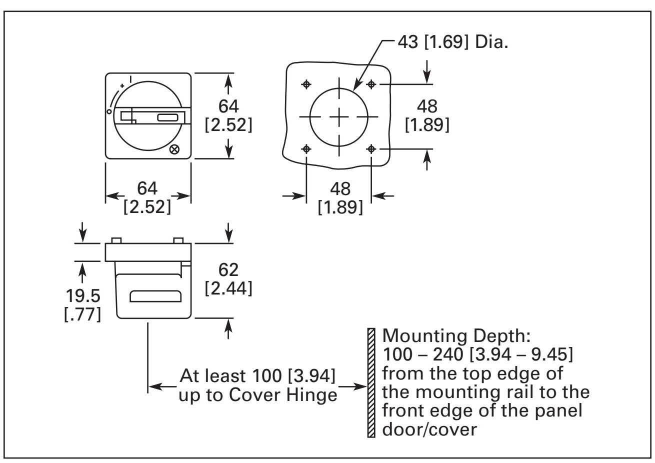


**Figure 34-127. Rotary Handle Mechanism — XTPAXRHM…
(Approximate Dimensions in mm [in])**

Contents



***XT* Combination Motor Controller and Manual Motor Controller**

Product Description

The new Cutler-Hammer® ***XT*** IEC Open Non-reversing and Reversing Manual Motor Controllers from Eaton's electrical business combine a Manual Motor Protector with an IEC Contactor(s) to provide a complete motor protection solution by combining motor disconnect function, thermal overload protection, magnetic short circuit protection and remote control operation in one compact, assembled unit. These assembled Manual Motor Controllers cover motors with FLA ratings from 0.10A to 63A.

The UL 508 Type F labeled Combination Motor Controller (CMC) includes a Line Side Adapter (LSA). These assembled Combination Motor Controllers cover motors with FLA ratings from 0.10A to 52A.

Application Description

The ***XT*** IEC Non-reversing and Reversing Manual and Combination Motor Controllers can be used in the following applications:

XTSC and XTSR

- Manual Motor Controller for Single and Multi Motor Panels — The preassembled ***XT*** Manual Motor Controllers (MMC) combine a Manual Motor Protector, a Wiring Connector Link and IEC Contactor. MMCs can also be field installed with separate MMP, WCL and Contactor(s). An IEC magnetic contactor has been added to allow for remote operation of the motor circuit.

XTFC and XTFR

- Combination Motor Controller (UL 508, Type F), for Single and Multi Motor Panels — The preassembled IEC Combination Motor Controllers combine a Line Side Adapter, Manual Motor Protector, Wiring Connector Link and IEC Contactor. The XTPR Manual Motor Protectors are UL listed as UL 508, Type E Self-Protected Manual Combination Starters. This UL listing allows these devices to be used in motor circuits without having to add separate branch short circuit protection. An IEC magnetic contactor has been added to allow for remote operation of the motor circuit.
- Group Motor Installations — Since the Manual Motor Protectors (Manual Combination Starters) are UL listed for Group Motor Installations, the IEC Manual Motor Controllers provide a compact, assembled package for Group Motor Installations up to 600V.

For Group Installations (in-panel SCPD) applying the traditional 1/3 tap rule, the Manual Motor Protectors and Combination Motor Controllers may be used on 480V Delta systems along with 480Y/277V and 600Y/347V slash rated Wye systems. For Group Installations, applying the more recent 1/10 tap conductor rule, a maximum 240V Delta is permitted or 480Y/277V and 600Y/347V slash rated Wye systems.

For actual UL 508 Type E/F applications (out-of-panel upstream feeder Short-Circuit Protective Device [SCPD] only), a maximum 240V Delta is permitted or 480Y/277V and 600Y/347V slash rated Wye systems.

For Manual "At Motor" Disconnect applications, a maximum 240V Delta is permitted or 480Y/277V and 600Y/347V slash rated Wye systems.

Features

- ON/OFF rotary handle with lockout provision
- Visible trip indication
- Test trip function
- Motor applications from 0.10A to 63A
- Class 10 overload protection
- Built-in heater and magnetic trip elements to protect the motor
- Phase loss sensitivity
- Type 2 coordination
- Ambient compensated up to 55°C [140°F]
- Control inputs located at front of starter for easy access and wiring
- Wide range of coils
- DIN Rail mount — XTSC...BB_
- Mounting plates — XTSC...BC_, XTSC...D motor controllers
- Adjustment dial for setting motor FLA
- Short circuit trip at 14 times the maximum setting of the FLA adjustment dial
- UL 508 Type F CMC High Fault Short Circuit Ratings: Refer to **Table 34-232**.
- 1NO-1NC Auxiliary Contact as standard on Manual Motor Controller and Combination Motor Controller

Standards and Certifications

UL 508 Type F Combination Motor Controller

- IEC Type 2 Approved per IEC 60947-4-1
- UL Listed File No. E245398
- CE Mark

Note: For Type 2 Coordination of MMCs, see **Tables 34-247** through **34-249** on **Pages 34-200** and **34-201**.

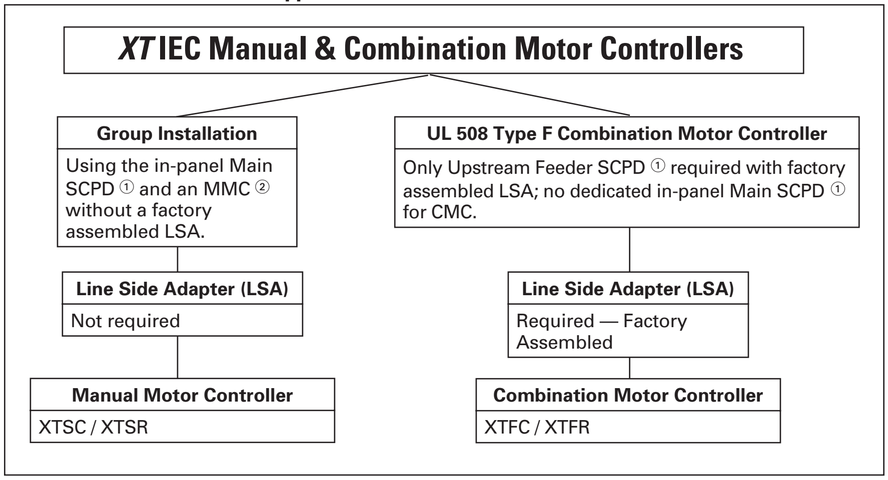
Protection in Different Controller Types

A UL 508 Type E Self-protected Manual Combination Starter/Motor Controller consists of a single device having integral short circuit protection, a main set of contacts, motor overload protection, and may also include a UL listed Line Side Adapter (see **Table 34-221**). This type of controller is a legitimate short circuit protective device and disconnect means for the downstream motor. It does require an upstream feeder short circuit protective device, but does not require a dedicated branch circuit protection or a disconnect means if used with a Line Side Adapter. A UL 508 Type E rating means that the unit clears a fault and does not experience any welding of the power poles. A UL 508 Type E self-protected manual motor controller will remain fully functional should a short circuit within its ratings occur. *E.g*. XTPR.

An ***XT*** *UL 508 Type F Self-protected Combination Motor Controller* consists of a UL Listed Type E Self-protected Manual Combination Starter/Motor Controller, a UL Listed Contactor, and a UL Listed Line Side Adapter (see **Table 34-221**). While the UL 508 Type E self-protected manual motor protector of this combination motor controller device is a legitimate short circuit protective device and disconnect means for the downstream motor, the contactor is *not* "self-protected." *E.g.* XTFC, XTFR.

In addition, as a complete assembly or modular components, the device should have Type 2 Coordination certification. Type 2 Coordination means the Starter or the Controller must exhibit little or no damage following a major short circuit fault and should be able to be returned to proper service without replacing any parts.

Table 34-221. MMC and CMC Applications



① SCPD = Short Circuit Protective Device (Circuit Breaker, Fuses).
② MMC = Manual Motor Controller

Reference: Technical Paper AP03402001E.

Note: Line Side Adapters are not required for non-U.S. applications. Most countries outside of the U.S. classify the MMP as a thermal magnetic circuit breaker.

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Catalog Number Selection

Table 34-222. Combination Motor Controllers — Catalog Numbering System

XT SC 012 B B A

Design	
XT =	*XT* IEC Power Control

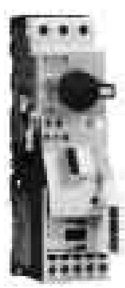
Type	
SC =	Manual Motor Controller — FVNR
SR =	Manual Motor Controller — FVR
FC =	Combination Motor Controller, UL 508 Type F — FVNR
FR =	Combination Motor Controller, UL 508 Type F — FVR

Rated Current of MMP	
B-Frame	**D-Frame**
P16 = 0.16A	**016** = 16A
P25 = 0.25A	**025** = 25A
P40 = 0.40A	**032** = 32A
P63 = 0.63A	**040** = 40A
001 = 1A	**050** = 50A
1P6 = 1.6A	**058** = 58A
2P5 = 2.5A	**063** = 63A
004 = 4A	
6P3 = 6.3A	
010 = 10A	
012 = 12A	
016 = 16A	
020 = 20A	
025 = 25A	
032 = 32A	

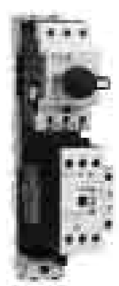
Frame Size — MMP	
B =	45 mm, 0.1 to 32A
D =	55 mm, 16 to 63A

Frame Size — Contactor	
B =	45 mm, 7 to 15A
C =	45 mm, 18 to 32A
D =	55 mm, 40 to 65A

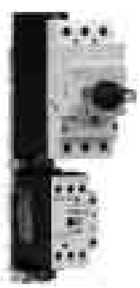
Coil Voltage	
A =	110V 50 Hz, 120V 60 Hz
B =	220V 50 Hz, 240V 60 Hz
C =	415V 50 Hz, 480V 60 Hz
D =	550V 50 Hz, 600V 60 Hz
E =	208V 50 Hz
F =	230V 50 Hz
G =	190V 50 Hz, 220V 60 Hz
H =	240V 50 Hz, 277V 60 Hz
L =	380V 50 Hz, 440V 60 Hz
N =	400V 50 Hz
P =	380V 60 Hz
R =	12V 50/60 Hz
T =	24V 50/60 Hz
U =	24V 50 Hz
W =	42V 50 Hz, 48V 60 Hz
Y =	48V 50 Hz
AD =	120V DC
BD =	220V DC
RD =	12V DC
TD =	24V DC
WD =	48V DC



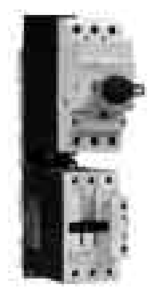
XTSC FVNR Frame B MMP & Frame B Contactor



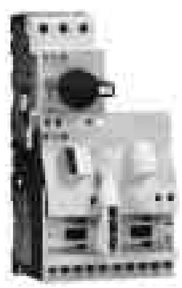
XTSC FVNR Frame B MMP & Frame C Contactor



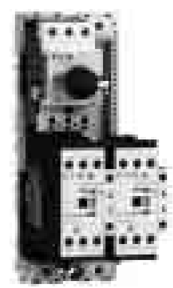
XTSC FVNR Frame D MMP & Frame C Contactor



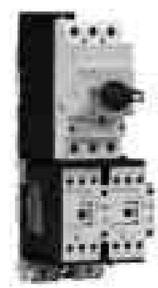
XTSC FVNR Frame D MMP & Frame D Contactor



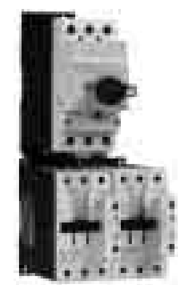
XTSR FVR Frame B MMP & (2) Frame B Contactors



XTSR FVR Frame B MMP & (2) Frame C Contactors



XTSR FVR Frame D MMP & (2) Frame C Contactors



XTSR FVR Frame D MMP & (2) Frame D Contactors

Product Selection

Table 34-223. XTSC and XTSR Manual Motor Controllers (MMC) / Starter Combinations

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor															
FLA Adjustment Range / Overload Release — I_r (Amps)	Short-Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings — P ①								Assembled Manual Motor Controller ③					
		Maximum Motor kW Rating AC-3 — P (kW)				Maximum hp Rating — P (hp)									
		Three-Phase				Three-Phase				Non-reversing			Reversing		
		220 – 240V	380 – 415V	500V	660 – 690V	200V	240V	480V	600V	Catalog Number	Price U.S. $ AC Coil	Price U.S. $ DC Coil	Catalog Number	Price U.S. $ AC Coil	Price U.S. $ DC Coil
Frame B MMP + Frame B Contactor															
0.1 – 0.16	3.2	—	—	—	0.06	②	②	1/2	1/2	**XTSCP16BB_**			**XTSRP16BB_**		
0.16 – 0.25	3.5	—	0.06	0.06	0.12	②	②	1/2	1/2	**XTSCP25BB_**			**XTSRP25BB_**		
0.25 – 0.4	5.6	0.06	0.09	0.12	0.18	②	②	1/2	1/2	**XTSCP40BB_**			**XTSRP40BB_**		
0.4 – 0.63	8.82	0.09	0.18	0.25	0.25	②	②	1/2	1/2	**XTSCP63BB_**			**XTSRP63BB_**		
0.63 – 1	14	0.12	0.25	0.37	0.55	②	②	1/2	1/2	**XTSC001BB_**			**XTSR001BB_**		
1 – 1.6	22.4	0.25	0.55	0.75	1.1	②	②	3/4	1	**XTSC1P6BB_**			**XTSR1P6BB_**		
1.6 – 2.5	35	0.37	0.75	1.1	1.5	1/2	1/2	1	1-1/2	**XTSC2P5BB_**			**XTSR2P5BB_**		
2.5 – 4	56	0.75	1.5	2.2	3	1	1	2	3	**XTSC004BB_**			**XTSR004BB_**		
4 – 6.3	88.2	1.1	2.2	3	4	1-1/2	1-1/2	3	5	**XTSC6P3BB_**			**XTSR6P3BB_**		
6.3 – 10	140	2.2	4	4	7.5	3	3	7-1/2	10	**XTSC010BB_**			**XTSR010BB_**		
8 – 12	168	3	5.5	5.5	11	3	3	7-1/2	10	**XTSC012BB_**			**XTSR012BB_**		
10 – 16	224	4	7.5	9	12.5	3	3	10	10	**XTSC016BB_**			**—**		
Frame B MMP + Frame C Contactor															
10 – 16	224	4	7.5	9	12.5	3	3	10	10	**XTSC016BC_**			**XTSR016BC_**		
16 – 20	280	5.5	9	12.5	15	5	5	10	15	**XTSC020BC_**			**XTSR020BC_**		
20 – 25	350	5.5	11	15	22	5	7-1/2	15	20	**XTSC025BC_**			**XTSR025BC_**		
25 – 32	448	7.5	15	22	30	7-1/2	10	20	25	**XTSC032BC_**			**XTSR032BC_**		
Frame D MMP + Frame C Contactor															
10 – 16	224	4	7.5	9	12.5	3	5	10	15	**XTSC016DC_**			**XTSR016DC_**		
16 – 25	350	5.5	12.5	12.5	22	7-1/2	7-1/2	20	25	**XTSC025DC_**			**XTSR025DC_**		
25 – 32	448	7.5	15	17.5	22	10	10	25	30	**XTSC032DC_**			**XTSR032DC_**		
Frame D MMP + Frame D Contactor															
32 – 40	560	11	20	22	30	10	—	30	30	**XTSC040DD_**			**XTSR040DD_**		
40 – 50	700	14	25	30	45	15	15	30	40	**XTSC050DD_**			**XTSR050DD_**		
50 – 58	812	17	30	37	55	—	—	40	—	**XTSC058DD_**			**XTSR058DD_**		
55 – 63	882	18.5	34	37	55	—	—	40	—	**XTSC063DD_**			**XTSR063DD_**		

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only. For additional voltages not listed, see **Table 34-228** on **Page 34-183**.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.
③ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.

Notes:

The assembled Manual Motor Controller (MMC) consists of an XTPR Manual Motor Protector (MMP) and an XTCE contactor. For Frame B MMP + Frame B Contactor assemblies, the XTSC and XTSR can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB, XTPAXRPCRB). For 16A and above, the assembly is mounted via a DIN Rail Adapter Plate (XTPAXTPCPC, XTPAXTPCPD) and the electrical connection is made with electrical contact modules (XTPAXECMC, XTPAXECMD), both included in XTPAXTPCC and XTPAXTPCD. For detailed component lists, see **Table 34-229**, **Page 34-184**.

Service Factor Settings: Setting I_r of current scale in dependence of load factor:
SF = 1.15 ➔ $I_r = 1 \times I_{n\ mot}$
SF = 1 ➔ $I_r = 0.9 \times I_{n\ mot}$

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

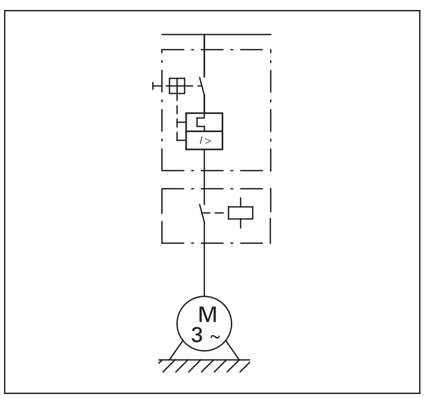


Figure 34-128. XTSC Manual Motor Controller

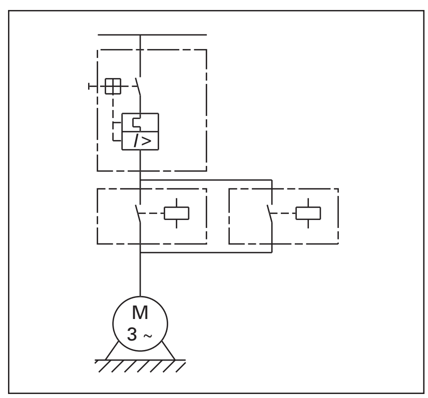


Figure 34-129. XTSR Manual Motor Controller

Accessories .... **Page 34-148**
Technical Data .... **Page 34-183**
Discount Symbol **1CD7**

Table 34-224. XTFC and XTFR Combination Motor Controllers (CMC), UL508 Type F

FLA Adjustment Range / Overload Release — I_r (Amps)	Short-Circuit Release — I_{rm} (Amps)	Maximum Motor Ratings ①								Assembled Combination Motor Controller ③					
		Maximum Motor kW Rating AC-3 — P (kW)				Maximum hp Rating — P (hp)									
		Three-Phase				Three-Phase				Non-reversing			Reversing		
		220 – 240V	380 – 415V	500V	660 – 690V	200V	240V	480V	600V	Catalog Number	Price U.S. $ AC Coil	Price U.S. $ DC Coil	Catalog Number	Price U.S. $ AC Coil	Price U.S. $ DC Coil
Frame B MMP + Frame B Contactor															
0.1 – 0.16	2.2	—	—	—	0.06	②	②	1/2	1/2	XTFCP16BB_			XTFRP16BB_		
0.16 – 0.25	3.5	—	0.06	0.06	0.12	②	②	1/2	1/2	XTFCP25BB_			XTFRP25BB_		
0.25 – 0.4	5.6	0.06	0.09	0.12	0.18	②	②	1/2	1/2	XTFCP40BB_			XTFRP40BB_		
0.4 – 0.63	8.82	0.09	0.18	0.25	0.25	②	②	1/2	1/2	XTFCP63BB_			XTFRP63BB_		
0.63 – 1	14	0.12	0.25	0.37	0.55	②	②	1/2	1/2	XTFC001BB_			XTFR001BB_		
1 – 1.6	22.4	0.25	0.55	0.75	1.1	②	②	3/4	1	XTFC1P6BB_			XTFR1P6BB_		
1.6 – 2.5	35	0.37	0.75	1.1	1.5	1/2	1/2	1	1-1/2	XTFC2P5BB_			XTFR2P5BB_		
2.5 – 4	56	0.75	1.5	2.2	3	1	1	2	3	XTFC004BB_			XTFR004BB_		
4 – 6.3	88.2	1.1	2.2	3	4	1-1/2	1-1/2	3	5	XTFC6P3BB_			XTFR6P3BB_		
6.3 – 10	140	2.2	4	4	7.5	3	3	7-1/2	10	XTFC010BB_			XTFR010BB_		
8 – 12	168	3	5.5	5.5	11	3	3	7-1/2	—	XTFC012BB_			XTFR012BB_		
10 – 16	224	4	7.5	9	12.5	3	3	10	—	XTFC016BB_			—		
Frame B MMP + Frame C Contactor															
10 – 16	224	4	7.5	9	12.5	3	5	10	—	XTFC016BC_			XTFR016BC_		
16 – 20	280	5.5	9	12.5	15	5	5	10	—	XTFC020BC_			XTFR020BC_		
20 – 25	350	5.5	11	15	22	5	7-1/2	15	—	XTFC025BC_			XTFR025BC_		
25 – 32	448	7.5	15	22	30	7-1/2	10	20	—	XTFC032BC_			XTFR032BC_		
Frame D MMP + Frame C Contactor															
10 – 16	224	4	7.5	9	12.5	3	5	10	15	XTFC016DC_			XTFR016DC_		
16 – 25	350	5.5	12.5	12.5	22	7-1/2	7-1/2	20	25	XTFC025DC_			XTFR025DC_		
25 – 32	448	7.5	15	17.5	22	10	10	25	30	XTFC032DC_			XTFR032DC_		
Frame D MMP + Frame D Contactor															
32 – 40	560	11	20	22	30	10	—	30	30	XTFC040DD_			XTFR040DD_		

① Select Combination Motor Controllers by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only. For additional voltages not listed, see **Table 34-228** on **Page 34-183**.

② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.

③ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.

Notes:

The assembled Combination Motor Controller (CMC) consists of an XTPR Manual Motor Protector (MMP) and an XTCE contactor and a required Line Side Adapter. For Frame B MMP + Frame B Contactor assemblies, the XTFC and XTFR can be mounted directly on DIN rail without an adapter. The contactors are supported mechanically with a mechanical connection element (included in XTPAXTPCB, XTPAXRPCRB). For 16A and above, the assembly is mounted via a DIN Rail Adapter Plate (XTPAXTPCPC, XTPAXT-PCPD) and the electrical connection is made with electrical contact modules (XTPAX-ECMC, XTPAXECMD), both included in XTPAXTPCC and XTPAXTPCD. For detailed component lists, see **Table 34-230**, **Page 34-185**.

Service Factor Settings: Setting I_r of current scale in dependence of load factor:

SF = 1.15 → $I_r = 1 \times I_{n\ mot}$
SF = 1 → $I_r = 0.9 \times I_{n\ mot}$

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

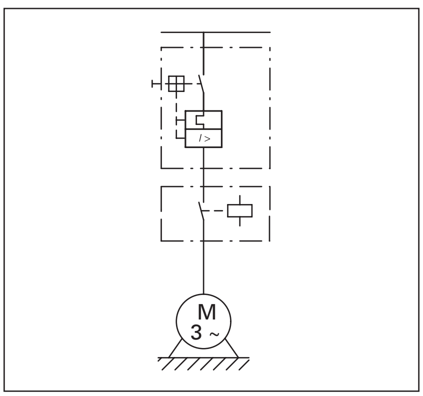


Figure 34-130. XTFC Combination Motor Controller

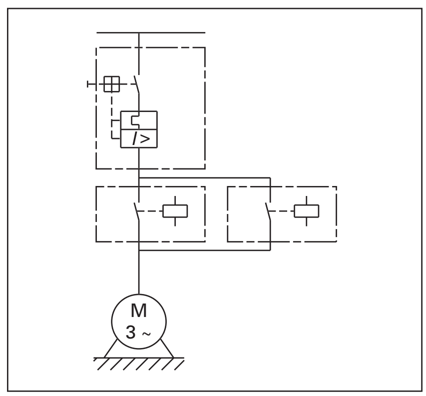


Figure 34-131. XTFR Combination Motor Controller

Discount Symbol **1CD7**

Table 34-225. AC and DC Coil Suffixes

Coil Voltage	Suffix Code	Coil Voltage	Suffix Code
Frame B Contactors		**Frame C and D Contactors**	
110V 50 Hz, 120V 60 Hz	**A**	110V 50 Hz, 120V 60 Hz	**A**
220V 50 Hz, 240V 60 Hz	**B**	220V 50 Hz, 240V 60 Hz	**B**
230V 50 Hz	**F**	230V 50 Hz	**F**
24V 50/60 Hz	**T**	24V 50/60 Hz	**T**
24V DC	**TD** ①	24 – 27V DC	**TD** ①
415V 50 Hz, 480V 60 Hz	**C**	415V 50 Hz, 480V 60 Hz	**C**
550V 50 Hz, 600V 60 Hz	**D**	550V 50 Hz, 600V 60 Hz	**D**
208V 60 Hz	**E**	208V 60 Hz	**E**
190V 50 Hz, 220V 60 Hz	**G**	190V 50 Hz, 220V 60 Hz	**G**
240V 50 Hz, 277V 60 Hz	**H**	240V 50 Hz, 277V 60 Hz	**H**
380V 50 Hz, 440V 60 Hz	**L**	380V 50 Hz, 440V 60 Hz	**L**
400V 50 Hz	**N**	400V 50 Hz	**N**
380V 60 Hz	**P**	380V 60 Hz	**P**
12V 50/60 Hz	**R**	12V 50/60 Hz	**R**
24V 50 Hz	**U**	24V 50 Hz	**U**
42V 50 Hz, 48V 60 Hz	**W**	42V 50 Hz, 48V 60 Hz	**W**
48V 50 Hz	**Y**	48V 50 Hz	**Y**
120V DC	**AD** ①	110 – 130V DC	**AD** ①
220V DC	**BD** ①	200 – 240V DC	**BD** ①
12V DC	**RD** ①	12 – 14V DC	**RD** ①
48V DC	**WD** ①	48 – 60V DC	**WD** ①

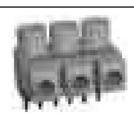
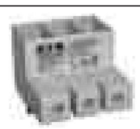
① With DC Operation: Integrated diode-resistor combination, coil rating 2.6W.

Accessories

Line Side Adapters

Line Side Adapters are required for use with XTPR MMPs only when used as Type E Self-Protected Manual Combination Starters or as part of XTFC or XTFR Type F Combination Motor Controllers. Not required for Group Installation.

Table 34-226. Line Side Adapters

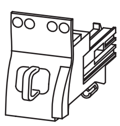
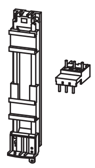
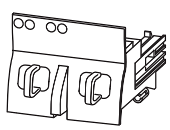
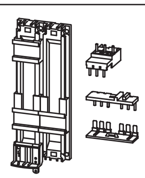
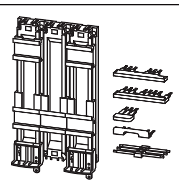
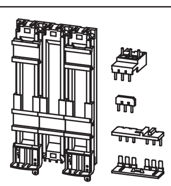
	Description	Catalog Number	Price U.S. $
	For use with Frame B MMPs (up to 32A)	**XTPAXLSA**	
	For use with Frame D MMPs (up to 40A)	**XTPAXLSAD**	

Discount Symbol **1CD7**

Combination Connection Kits

Combination Connection Kits include the necessary components to field assemble a Manual Motor Controller with an MMP (XTPR) and Contactor (XTCE).

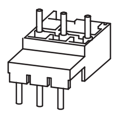
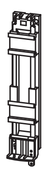
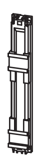
Table 34-227. Combination Connection Kits

	For Use with…	Description	Std. Pack	Catalog Number	Price U.S. $
Non-reversing Starters					
	XTPR...B + XTCE...B	Comprised of: ■ Mechanical connection element for XTPR...B and contactor ■ Main current wiring between XTPR...B and contactor in tool-less plug connection ■ Cable guidance Use as contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. 6 cables up to 2.5 mm^2 external diameter or 4 cables up to 3.5 mm^2 external diameter.	1	**XTPAXTPCB**	
	XTPR...B + XTCE...C	Comprised of: ■ DIN rail adapter plate ■ Main current wiring between XTPR and contactor	1	**XTPAXTPCC**	
	XTPR...D + XTCE...D		1	**XTPAXTPCD**	
Reversing Starters					
	XTPR...B + XTCE...B01_	Comprised of: ■ Mechanical connection element for XTPR...B and contactor ■ Reversing starter main current wiring in tool-less plug connection ■ Control cables for electrical interlocking in tool-less plug connection: – K1M: A1 – K2M: 21 – K1M: 21 – K2M: A1 – K1M: A2 – K2M: A2 ■ Cable guidance Use as contactor auxiliary switch XTCEXFAT_. Control cable guidance: max. 6 cables up to 2.5 mm^2 external diameter or 4 cables up to 3.5 mm^2 external diameter.	1	**XTPAXTPCRB**	
	XTPR...B + XTCE...C	Comprised of: ■ DIN rail adapter plate ■ Reversing starter main current wiring	1	**XTPAXTPCRC**	
Star-Delta Starter Sets					
	XTPR...B + XTCE...B	Comprised of: ■ DIN rail adapter plate ■ Main current wiring between XTPR...B and contactor ■ Electrical interlock between delta and star contactor ■ Use as contactor auxiliary switch XTCEXFAT_	1	**XTPAXSDSB**	
	XTPR...B + XTCE...C	Comprised of: ■ DIN rail adapter plate ■ Main current wiring between XTPR...B and contactor	1	**XTPAXSDSC**	

Discount Symbol **1CD7**

Combination Connection Kits

Table 34-227. Combination Connection Kits (Continued)

	For Use with…	Description	Std. Pack	Catalog Number	Price U.S. $ ①
Electric Contact Module					
	XTPR...B + XTCE...C	Comprised of: ■ Main current wiring between XTPR...B and contactor ■ Use only in combination with busbar adapter	5	**XTPAXECMC**	
	XTPR...D + XTCE...D	Comprised of: ■ Main current wiring between XTPR...D and contactor ■ Use only in combination with busbar adapter	5	**XTPAXECMD**	
DIN Rail Adapter Plates					
	XTPAXTPCB XTPAXTPCRB	Comprised of: ■ 45 mm wide adapter plate with one DIN rail ■ Connection element for side-by-side positioning of further plates	4	**XTPAXTPCPB**	
	XTPR...B + XTCE...C XTPAXECMC	Comprised of: ■ 45 mm wide adapter plate with two DIN rails ■ Connection element for side-by-side positioning of further plates	4	**XTPAXTPCRPB**	
	XTPAXECMD XTPR...D + XTCE...C XTPR...D + XTCE...D	Comprised of: ■ 55 mm wide adapter plate with two DIN rails ■ Connection cams for further plates ■ For use with reversing and star-delta starters	4	**XTPAXTPCPD**	
Lateral Module					
	—	■ Can be grouped on the DIN rail adapter ■ Expansion of the mounting width by 9 mm	10	**XTPAXLM**	
Connection Element					
	—	■ For connection of several DIN rail adapters	50	**XTPAXCNE**	

① Orders must be placed in multiples of package quantity listed.

Discount Symbol **1CD7**

Technical Data and Specifications

Table 34-228. Manual and Combination Motor Controllers Motor Ratings

Assembled Controller ③		FLA Adjustment Range / Overload Release — I_r (Amps)	Maximum Motor Ratings — P ①													
			Maximum Motor kW Rating AC-3 — P (kW)					Maximum hp Rating — P (hp)								
			Three-Phase					Single-Phase				Three-Phase				
Non-reversing	Reversing		220 – 240V	380 – 415V	440V	500V	660 – 690V	115V	200V	208V	240V	200V	208V	240V	480V	600V
XTSC & XTSR Manual Motor Controllers (MMC) / Starter Combinations																
XTSC & XTSR Frame B MMP + Frame B Contactor																
XTSCP16BB_	XTSRP16BB_	0.1 – 0.16	—	—	—	—	0.06	②	②	②	②	②	②	②	1/2	1/2
XTSCP25BB_	XTSRP25BB_	0.16 – 0.25	—	0.06	0.06	0.06	0.12	②	②	②	②	②	②	②	1/2	1/2
XTSCP40BB_	XTSRP40BB_	0.25 – 0.4	0.06	0.09	0.12	0.12	0.18	②	②	②	②	②	②	②	1/2	1/2
XTSCP63BB_	XTSRP63BB_	0.4 – 0.63	0.09	0.18	0.18	0.25	0.25	②	②	②	②	②	②	②	1/2	1/2
XTSC001BB_	XTSR001BB_	0.63 – 1	0.12	0.25	0.25	0.37	0.55	②	②	②	②	②	②	②	1/2	1/2
XTSC1P6BB_	XTSR1P6BB_	1 – 1.6	0.25	0.55	0.55	0.75	1.1	②	②	②	1/10	②	②	②	3/4	1
XTSC2P5BB_	XTSR2P5BB_	1.6 – 2.5	0.37	0.75	1.1	1.1	1.5	—	1/8	1/8	1/6	1/2	1/2	1/2	1	1-1/2
XTSC004BB_	XTSR004BB_	2.5 – 4	0.75	1.5	1.5	2.2	3	1/8	1/4	1/4	1/3	1	1	1	2	3
XTSC6P3BB_	XTSR6P3BB_	4 – 6.3	1.1	2.2	3	3	4	1/4	1/2	1/2	1/2	1-1/2	1-1/2	1-1/2	3	5
XTSC010BB_	XTSR010BB_	6.3 – 10	2.2	4	4	4	7.5	1/2	1	1	1-1/2	3	3	3	7-1/2	10
XTSC012BB_	XTSR012BB_	8 – 12	3	5.5	5.5	5.5	11	1/2	1-1/2	1-1/2	2	3	3	3	7-1/2	10
XTSC016BB_	—	10 – 16	4	7.5	9	9	12.5	1	2	2	2	3	3	3	10	10
XTSC & XTSR Frame B MMP + Frame C Contactor																
XTSC016BC_	XTSR016BC_	10 – 16	4	7.5	9	9	12.5	1	2	2	2	3	3	5	10	10
XTSC020BC_	XTSR020BC_	16 – 20	5.5	9	11	12.5	15	1-1/2	3	3	3	5	5	5	10	15
XTSC025BC_	XTSR025BC_	20 – 25	5.5	11	12.5	15	22	1-1/2	3	3	3	5	5	7-1/2	15	20
XTSC032BC_	XTSR032BC_	25 – 32	7.5	15	15	22	30	2	3	3	5	7-1/2	7-1/2	10	20	25
XTSC & XTSR Frame D MMP + Frame C Contactor																
XTSC016DC_	XTSR016DC_	10 – 16	4	7.5	9	9	12.5	1	2	2	3	3	5	5	10	15
XTSC025DC_	XTSR025DC_	16 – 25	5.5	12.5	12.5	12.5	22	2	3	3	3	7-1/2	7-1/2	7-1/2	20	25
XTSC032DC_	XTSR032DC_	25 – 32	7.5	15	17.5	17.5	22	3	5	5	5	10	10	10	25	30
XTSC & XTSR Frame D MMP + Frame D Contactor																
XTSC040DD_	XTSR040DD_	32 – 40	11	20	22	22	30	3	5	—	7-1/2	10	—	—	30	30
XTSC050DD_	XTSR050DD_	40 – 50	14	25	30	30	45	—	7-1/2	7-1/2	—	15	15	15	30	40
XTSC058DD_	XTSR058DD_	50 – 58	17	30	37	37	55	—	—	—	10	—	—	—	40	—
XTSC063DD_	XTSR063DD_	55 – 63	18.5	34	37	37	55	—	—	—	—	—	—	—	40	—
XTFC & XTFR Combination Motor Controllers (CMC), UL508 Type F																
XTFC & XTFR Frame B MMP + Frame B Contactor																
XTFCP16BB_	XTFRP16BB_	0.1 – 0.16	—	—	—	—	0.06	②	②	②	②	②	②	②	1/2	1/2
XTFCP25BB_	XTFRP25BB_	0.16 – 0.25	—	0.06	0.06	0.06	0.12	②	②	②	②	②	②	②	1/2	1/2
XTFCP40BB_	XTFRP40BB_	0.25 – 0.4	0.06	0.09	0.12	0.12	0.18	②	②	②	②	②	②	②	1/2	1/2
XTFCP63BB_	XTFRP63BB_	0.4 – 0.63	0.09	0.18	0.18	0.25	0.25	②	②	②	②	②	②	②	1/2	1/2
XTFC001BB_	XTFR001BB_	0.63 – 1	0.12	0.25	0.25	0.37	0.55	②	②	②	②	②	②	②	1/2	1/2
XTFC1P6BB_	XTFR1P6BB_	1 – 1.6	0.25	0.55	0.55	0.75	1.1	②	②	②	1/10	②	②	②	3/4	1
XTFC2P5BB_	XTFR2P5BB_	1.6 – 2.5	0.37	0.75	1.1	1.1	1.5	—	1/8	1/8	1/6	1/2	1/2	1/2	1	1-1/2
XTFC004BB_	XTFR004BB_	2.5 – 4	0.75	1.5	1.5	2.2	3	1/8	1/4	1/4	1/3	1	1	1	2	3
XTFC6P3BB_	XTFR6P3BB_	4 – 6.3	1.1	2.2	3	3	4	1/4	1/2	1/2	1/2	1-1/2	1-1/2	1-1/2	3	5
XTFC010BB_	XTFR010BB_	6.3 – 10	2.2	4	4	4	7.5	1/2	1	1	1-1/2	3	3	3	7-1/2	10
XTFC012BB_	XTFR012BB_	8 – 12	3	5.5	5.5	5.5	11	1/2	1-1/2	1-1/2	2	3	3	3	7-1/2	—
XTFC016BB_	—	10 – 16	4	7.5	9	9	12.5	1	2	2	2	3	3	3	10	—
XTFC & XTFR Frame B MMP + Frame C Contactor																
XTFC016BC_	XTFR016BC_	10 – 16	4	7.5	9	9	12.5	1	2	2	2	3	3	5	10	—
XTFC020BC_	XTFR020BC_	16 – 20	5.5	9	11	12.5	15	1-1/2	3	3	3	5	5	5	10	—
XTFC025BC_	XTFR025BC_	20 – 25	5.5	11	12.5	15	22	1-1/2	3	3	3	5	5	7-1/2	15	—
XTFC032BC_	XTFR032BC_	25 – 32	7.5	15	15	22	30	2	3	3	5	7-1/2	7-1/2	10	20	—
XTFC & XTFR Frame D MMP + Frame C Contactor																
XTFC016DC_	XTFR016DC_	10 – 16	4	7.5	9	9	12.5	1	2	2	3	3	5	5	10	15
XTFC025DC_	XTFR025DC_	16 – 25	5.5	12.5	12.5	12.5	22	2	3	3	3	7-1/2	7-1/2	7-1/2	20	25
XTFC032DC_	XTFR032DC_	25 – 32	7.5	15	17.5	17.5	22	3	5	5	5	10	10	10	25	30
XTFC & XTFR Frame D MMP + Frame D Contactor																
XTFC040DD_	XTFR040DD_	32 – 40	11	20	22	22	30	3	5	—	7-1/2	10	—	—	30	30

① Select Manual Motor Protectors by full load amperes. Maximum Motor Ratings (kW, hp) are for reference only.
② In this range, calculate motor rating according to rated current. Specified values to NEC Table 430-150.
③ Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.

Notes:

Service Factor Settings: Setting I_r of current scale in dependence of load factor:

SF = 1.15 ➔ $I_r = 1 \times I_{n\ mot}$
SF = 1 ➔ $I_r = 0.9 \times I_{n\ mot}$

Single-phasing sensitivity to IEC/EN 60947-4-1, VDE 0660 Part 102.

Table 34-229. XTSC and XTSR Manual Motor Controllers (MMC) / Starter Combinations — Component Bill of Material

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor					
Assembled Manual Motor Controller ①	FLA Adjustment Range / Overload Release — I_r (Amps)	Component Catalog Numbers			
		Manual Motor Protector	Combination Connection Kit	Contactor ①	Manual Motor Protector Auxiliary Contact
Non-reversing					
XTSC Frame B MMP + Frame B Contactor					
XTSCP16BB_	0.1 – 0.16	XTPRP16BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSCP25BB_	0.16 – 0.25	XTPRP25BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSCP40BB_	0.25 – 0.4	XTPRP40BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSCP63BB_	0.4 – 0.63	XTPRP63BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSC001BB_	0.63 – 1	XTPR001BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSC1P6BB_	1 – 1.6	XTPR1P6BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSC2P5BB_	1.6 – 2.5	XTPR2P5BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSC004BB_	2.5 – 4	XTPR004BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSC6P3BB_	4 – 6.3	XTPR6P3BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTSC010BB_	6.3 – 10	XTPR010BC1	XTPAXTPCB	XTCE009B10_	XTPAXFA11
XTSC012BB_	8 – 12	XTPR012BC1	XTPAXTPCB	XTCE012B10_	XTPAXFA11
XTSC016BB_	10 – 16	XTPR016BC1	XTPAXTPCB	XTCE015B10_	XTPAXFA11
XTSC Frame B MMP + Frame C Contactor					
XTSC016BC_	10 – 16	XTPR016BC1	XTPAXTPCC	XTCE018C10_	XTPAXFA11
XTSC020BC_	16 – 20	XTPR020BC1	XTPAXTPCC	XTCE025C10_	XTPAXFA11
XTSC025BC_	20 – 25	XTPR025BC1	XTPAXTPCC	XTCE025C10_	XTPAXFA11
XTSC032BC_	25 – 32	XTPR032BC1	XTPAXTPCC	XTCE032C10_	XTPAXFA11
XTSC Frame D MMP + Frame C Contactor					
XTSC016DC_	10 – 16	XTPR016DC1	②	XTCE018C10_	XTPAXFA11
XTSC025DC_	16 – 25	XTPR025DC1	②	XTCE025C10_	XTPAXFA11
XTSC032DC_	25 – 32	XTPR032DC1	②	XTCE032C10_	XTPAXFA11
XTSC Frame D MMP + Frame D Contactor					
XTSC040DD_	32 – 40	XTPR040DC1	XTPAXTPCD ③	XTCE040D00_	XTPAXFA11
XTSC050DD_	40 – 50	XTPR050DC1	XTPAXTPCD ③	XTCE050D00_	XTPAXFA11
XTSC058DD_	50 – 58	XTPR058DC1	XTPAXTPCD ③	XTCE065D00_	XTPAXFA11
XTSC063DD_	55 – 63	XTPR063DC1	XTPAXTPCD ③	XTCE065D00_	XTPAXFA11
Reversing					
XTSR Frame B MMP + Frame B Contactor					
XTSRP16BB_	0.1 – 0.16	XTPBP16BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSRP25BB_	0.16 – 0.25	XTPRP25BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSRP40BB_	0.25 – 0.4	XTPRP40BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSRP63BB_	0.4 – 0.63	XTPRP63BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSR001BB_	0.63 – 1	XTPR001BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSR1P6BB_	1 – 1.6	XTPR1P6BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSR2P5BB_	1.6 – 2.5	XTPR2P5BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSR004BB_	2.5 – 4	XTPR004BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSR6P3BB_	4 – 6.3	XTPR6P3BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTSR010BB_	6.3 – 10	XTPR010BC1	XTPAXTPCRB	(2) XTCE009B10_	XTPAXFA11
XTSR012BB_	8 – 12	XTPR012BC1	XTPAXTPCRB	(2) XTCE012B10_	XTPAXFA11
XTSR Frame B MMP + Frame C Contactor					
XTSR016BC_	10 – 16	XTPR016BC1	XTPAXTPCRC	(2) XTCE018C10_	XTPAXFA11
XTSR020BC_	16 – 20	XTPR020BC1	XTPAXTPCRC	(2) XTCE025C10_	XTPAXFA11
XTSR025BC_	20 – 25	XTPR025BC1	XTPAXTPCRC	(2) XTCE025C10_	XTPAXFA11
XTSR032BC_	25 – 32	XTPR032BC1	XTPAXTPCRC	(2) XTCE032C10_	XTPAXFA11
XTSR Frame D MMP + Frame C Contactor					
XTSR016DC_	10 – 16	XTPR016DC1	②	(2) XTCE018C10_	XTPAXFA11
XTSR025DC_	16 – 25	XTPR025DC1	②	(2) XTCE025C10_	XTPAXFA11
XTSR032DC_	25 – 32	XTPR032DC1	②	(2) XTCE032C10_	XTPAXFA11
XTSR Frame D MMP + Frame D Contactor					
XTSR040DD_	32 – 40	XTPR040DC1	③	(2) XTCE040D00_	XTPAXFA11
XTSR050DD_	40 – 50	XTPR050DC1	③	(2) XTCE050D00_	XTPAXFA11
XTSR058DD_	50 – 58	XTPR058DC1	③	(2) XTCE065D00_	XTPAXFA11
XTSR063DD_	55 – 63	XTPR063DC1	③	(2) XTCE065D00_	XTPAXFA11

① Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.

② The connection between the XTPR…DC1 and the XTCE…C... contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCPD).

③ The reversing connection between the XTPR…DC1 and the (2) XTCE…C… contactors will be accomplished by using the non-reversing combination connection kit (XTPAXTPCD), Frame D reversing link kit (XTCEXRLD), additional DIN Rail Adapter Plate (XTPAXTPCPD), and DIN Adapter Connection Element (XTPAXCNE).

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Table 34-230. XTFC and XTFR Combination Motor Controllers (CMC), UL508 Type F — Component Bill of Material

Factory Assembled Motor Protective Device with Thermal and Magnetic Trip + Contactor + Required Line Side Adapter						
Assembled Combination Motor Controller ①	FLA Adjustment Range / Overload Release — I_r (Amps)	Component Catalog Numbers				
		Line Side Adapter	Manual Motor Protector	Combination Connection Kit	Contactor ①	Manual Motor Protector Auxiliary Contact
Non-reversing						
XTFC Frame B MMP + Frame B Contactor						
XTFCP16BB_	0.1 – 0.16	XTPAXLSA	XTPRP16BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFCP25BB_	0.16 – 0.25	XTPAXLSA	XTPRP25BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFCP40BB_	0.25 – 0.4	XTPAXLSA	XTPRP40BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFCP63BB_	0.4 – 0.63	XTPAXLSA	XTPRP63BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFC001BB_	0.63 – 1	XTPAXLSA	XTPR001BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFC1P6BB_	1 – 1.6	XTPAXLSA	XTPR1P6BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFC2P5BB_	1.6 – 2.5	XTPAXLSA	XTPR2P5BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFC004BB_	2.5 – 4	XTPAXLSA	XTPR004BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFC6P3BB_	4 – 6.3	XTPAXLSA	XTPR6P3BC1	XTPAXTPCB	XTCE007B10_	XTPAXFA11
XTFC010BB_	6.3 – 10	XTPAXLSA	XTPR010BC1	XTPAXTPCB	XTCE009B10_	XTPAXFA11
XTFC012BB_	8 – 12	XTPAXLSA	XTPR012BC1	XTPAXTPCB	XTCE012B10_	XTPAXFA11
XTFC016BB_	10 – 16	XTPAXLSA	XTPR016BC1	XTPAXTPCB	XTCE015B10_	XTPAXFA11
XTFC Frame B MMP + Frame C Contactor						
XTFC016BC_	10 – 16	XTPAXLSA	XTPR016BC1	XTPAXTPCC	XTCE018C10_	XTPAXFA11
XTFC020BC_	16 – 20	XTPAXLSA	XTPR020BC1	XTPAXTPCC	XTCE025C10_	XTPAXFA11
XTFC025BC_	20 – 25	XTPAXLSA	XTPR025BC1	XTPAXTPCC	XTCE025C10_	XTPAXFA11
XTFC032BC_	25 – 32	XTPAXLSA	XTPR032BC1	XTPAXTPCC	XTCE032C10_	XTPAXFA11
XTFC Frame D MMP + Frame C Contactor						
XTFC016DC_	10 – 16	XTPAXLSAD	XTPR016DC1	②	XTCE018C10_	XTPAXFA11
XTFC025DC_	16 – 25	XTPAXLSAD	XTPR025DC1	②	XTCE025C10_	XTPAXFA11
XTFC032DC_	25 – 32	XTPAXLSAD	XTPR032DC1	②	XTCE032C10_	XTPAXFA11
XTFC Frame D MMP + Frame D Contactor						
XTFC040DD_	32 – 40	XTPAXLSAD	XTPR040DC1	XTPAXTPCD ③	XTCE040D00_	XTPAXFA11
XTFC050DD_	40 – 50	XTPAXLSAD	XTPR050DC1	XTPAXTPCD ③	XTCE050D00_	XTPAXFA11
XTFC058DD_	50 – 58	XTPAXLSAD	XTPR058DC1	XTPAXTPCD ③	XTCE065D00_	XTPAXFA11
XTFC063DD_	55 – 63	XTPAXLSAD	XTPR063DC1	XTPAXTPCD ③	XTCE065D00_	XTPAXFA11
Reversing						
XTFR Frame B MMP + Frame B Contactor						
XTFRP16BB_	0.1 – 0.16	XTPAXLSA	XTPRP16BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFRP25BB_	0.16 – 0.25	XTPAXLSA	XTPRP25BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFRP40BB_	0.25 – 0.4	XTPAXLSA	XTPRP40BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFRP63BB_	0.4 – 0.63	XTPAXLSA	XTPRP63BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFR001BB_	0.63 – 1	XTPAXLSA	XTPR001BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFR1P6BB_	1 – 1.6	XTPAXLSA	XTPR1P6BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFR2P5BB_	1.6 – 2.5	XTPAXLSA	XTPR2P5BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFR004BB_	2.5 – 4	XTPAXLSA	XTPR004BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFR6P3BB_	4 – 6.3	XTPAXLSA	XTPR6P3BC1	XTPAXTPCRB	(2) XTCE007B10_	XTPAXFA11
XTFR010BB_	6.3 – 10	XTPAXLSA	XTPR010BC1	XTPAXTPCRB	(2) XTCE009B10_	XTPAXFA11
XTFR012BB_	8 – 12	XTPAXLSA	XTPR012BC1	XTPAXTPCRB	(2) XTCE012B10_	XTPAXFA11
XTFR Frame B MMP + Frame C Contactor						
XTFR016BC_	10 – 16	XTPAXLSA	XTPR016BC1	XTPAXTPCRC	(2) XTCE018C10_	XTPAXFA11
XTFR020BC_	16 – 20	XTPAXLSA	XTPR020BC1	XTPAXTPCRC	(2) XTCE025C10_	XTPAXFA11
XTFR025BC_	20 – 25	XTPAXLSA	XTPR025BC1	XTPAXTPCRC	(2) XTCE025C10_	XTPAXFA11
XTFR032BC_	25 – 32	XTPAXLSA	XTPR032BC1	XTPAXTPCRC	(2) XTCE032C10_	XTPAXFA11
XTFR Frame D MMP + Frame C Contactor						
XTFR016DC_	10 – 16	XTPAXLSAD	XTPR016DC1	②	(2) XTCE018C10_	XTPAXFA11
XTFR025DC_	16 – 25	XTPAXLSAD	XTPR025DC1	②	(2) XTCE025C10_	XTPAXFA11
XTFR032DC_	25 – 32	XTPAXLSAD	XTPR032DC1	②	(2) XTCE032C10_	XTPAXFA11
XTFR Frame D MMP + Frame D Contactor						
XTFR040DD_	32 – 40	XTPAXLSAD	XTPR040DC1	③	(2) XTCE040D00_	XTPAXFA11
XTFR050DD_	40 – 50	XTPAXLSAD	XTPR050DC1	③	(2) XTCE050D00_	XTPAXFA11
XTFR058DD_	50 – 58	XTPAXLSAD	XTPR058DC1	③	(2) XTCE065D00_	XTPAXFA11
XTFR063DD_	55 – 63	XTPAXLSAD	XTPR063DC1	③	(2) XTCE065D00_	XTPAXFA11

① Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.
② The connection between the XTPR…DC1 and the XTCE…C... contactor will be made with flexible wire and mounted to the DIN Rail Adapter Plate (XTPAXTPCPD).
③ The reversing connection between the XTPR…DC1 and the (2) XTCE…C... contactors will be accomplished by using the non-reversing combination connection kit (XTPAXTPCD), Frame D reversing link kit (XTCEXRLD), additional DIN Rail Adapter Plate (XTPAXTPCPD), and DIN Adapter Connection Element (XTPAXCNE).

Table 34-231. Manual Motor Controllers Short-Circuit Ratings for UL/CSA Group Installations

XTSC & XTSR Manual Motor Controllers (MMC) / Starter Combinations								
Assembled Controller ①		FLA Adjustment Range / Overload Release — I_r (Amps)	Short-Circuit Release — I_{rm} (Amps)	Group Installation, UL/CSA				
				Max. RMS Symmetrical Short-Circuit Ratings (kA / kA with Current Limiter)			Maximum Upstream Protective Device (A / A with Current Limiter)	
Non-reversing	Reversing			240V	480V	600V	Maximum Fuse 600V	Maximum Circuit Breaker 600V
XTSC & XTSR Frame B MMP + Frame B Contactor								
XTSCP16BB_	XTSRP16BB_	0.1 – 0.16	2.2	50	50	50	600	600
XTSCP25BB_	XTSRP25BB_	0.16 – 0.25	3.5	50	50	50	600	600
XTSCP40BB_	XTSRP40BB_	0.25 – 0.4	5.6	50	50	50	600	600
XTSCP63BB_	XTSRP63BB_	0.4 – 0.63	8.82	50	50	50	600	600
XTSC001BB_	XTSR001BB_	0.63 – 1	14	50	50	50	600	600
XTSC1P6BB_	XTSR1P6BB_	1 – 1.6	22.4	50	50	50	600	600
XTSC2P5BB_	XTSR2P5BB_	1.6 – 2.5	35	50	50	50	600	600
XTSC004BB_	XTSR004BB_	2.5 – 4	56	50	50	50	600	600
XTSC6P3BB_	XTSR6P3BB_	4 – 6.3	88.2	50	50	50	600	600
XTSC010BB_	XTSR010BB_	6.3 – 10	140	22	22	22	150 / 600	125 / 600
XTSC012BB_	XTSR012BB_	8 – 12	168	10 / 50	10 / 50	10 / 50	150 / 600	125 / 600
XTSC016BB_	—	10 – 16	224	10 / 50	10 / 50	10 / 50	150 / 600	125 / 600
XTSC & XTSR Frame B MMP + Frame C Contactor								
XTSC016BC_	XTSR016BC_	10 – 16	224	10 / 50	10 / 50	10 / 50	150 / 600	125 / 600
XTSC020BC_	XTSR020BC_	16 – 20	280	10 / 18	10 / 18	10 / 18	150 / 600	125 / 600
XTSC025BC_	XTSR025BC_	20 – 25	350	10 / 18	10 / 18	10 / 18	150 / 600	125 / 600
XTSC032BC_	XTSR032BC_	25 – 32	448	5 / 18	5 / 18	5 / 18	150 / 600	125 / 600
XTSC & XTSR Frame D MMP + Frame C Contactor								
XTSC016DC_	XTSR016DC_	10 – 16	224	50	50	10	600	600
XTSC025DC_	XTSR025DC_	16 – 25	350	50	50	10	600	600
XTSC032DC_	XTSR032DC_	25 – 32	448	50	50	10	600	600
XTSC & XTSR Frame D MMP + Frame D Contactor								
XTSC040DD_	XTSR040DD_	32 – 40	560	50	50	10	600	600
XTSC050DD_	XTSR050DD_	40 – 50	700	50	50	10	600	600
XTSC058DD_	XTSR058DD_	50 – 58	812	50	50	—	—	—
XTSC063DD_	XTSR063DD_	55 – 63	882	50	50	—	—	—

① Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.

Table 34-232. Combination Motor Controllers Short Circuit Ratings for UL508 Type F Application

XTFC & XTFR Combination Motor Controllers (CMC), UL508 Type F								
Assembled Controller ②		FLA Adjustment Range / Overload Release — I_r (Amps)	Short-Circuit Release — I_{rm} (Amps)	UL508 Type F Application				
				Max. RMS Symmetrical Short-Circuit Ratings (kA)			Maximum Upstream Protective Device (A) ③	
Non-reversing	Reversing			240V	480/277V	600/347V	Maximum Fuse 600V	Maximum Circuit Breaker 600V
XTFC & XTFR Frame B MMP + Frame B Contactor								
XTFCP16BB_	XTFRP16BB_	0.1 – 0.16	2.2	50	50	18	Not Required	Not Required
XTFCP25BB_	XTFRP25BB_	0.16 – 0.25	3.5	50	50	18	Not Required	Not Required
XTFCP40BB_	XTFRP40BB_	0.25 – 0.4	5.6	50	50	18	Not Required	Not Required
XTFCP63BB_	XTFRP63BB_	0.4 – 0.63	8.82	50	50	18	Not Required	Not Required
XTFC001BB_	XTFR001BB_	0.63 – 1	14	50	50	18	Not Required	Not Required
XTFC1P6BB_	XTFR1P6BB_	1 – 1.6	22.4	50	50	18	Not Required	Not Required
XTFC2P5BB_	XTFR2P5BB_	1.6 – 2.5	35	50	50	18	Not Required	Not Required
XTFC004BB_	XTFR004BB_	2.5 – 4	56	50	50	18	Not Required	Not Required
XTFC6P3BB_	XTFR6P3BB_	4 – 6.3	88.2	50	50	18	Not Required	Not Required
XTFC010BB_	XTFR010BB_	6.3 – 10	140	50	50	18	Not Required	Not Required
XTFC012BB_	XTFR012BB_	8 – 12	168	42	42	—	Not Required	Not Required
XTFC016BB_	—	10 – 16	224	42	42	—	Not Required	Not Required
XTFC & XTFR Frame B MMP + Frame C Contactor								
XTFC016BC_	XTFR016BC_	10 – 16	224	18	18	—	Not Required	Not Required
XTFC020BC_	XTFR020BC_	16 – 20	280	18	18	—	Not Required	Not Required
XTFC025BC_	XTFR025BC_	20 – 25	350	18	18	—	Not Required	Not Required
XTFC032BC_	XTFR032BC_	25 – 32	448	18	18	—	Not Required	Not Required
XTFC & XTFR Frame D MMP + Frame C Contactor								
XTFC016DC_	XTFR016DC_	10 – 16	224	50	50	50	Not Required	Not Required
XTFC025DC_	XTFR025DC_	16 – 25	350	50	50	50	Not Required	Not Required
XTFC032DC_	XTFR032DC_	25 – 32	448	50	50	50	Not Required	Not Required
XTFC & XTFR Frame D MMP + Frame D Contactor								
XTFC040DD_	XTFR040DD_	32 – 40	560	50	50	50	Not Required	Not Required

② Underscore (_) indicates Magnetic Coil Suffix required. See **Table 34-225** on **Page 34-180**.

③ For UL508 Type F applications, the Combination Motor Controller assembly does not require a dedicated upstream protective device in the panel, thus a maximum rating is not required.

Dimensions

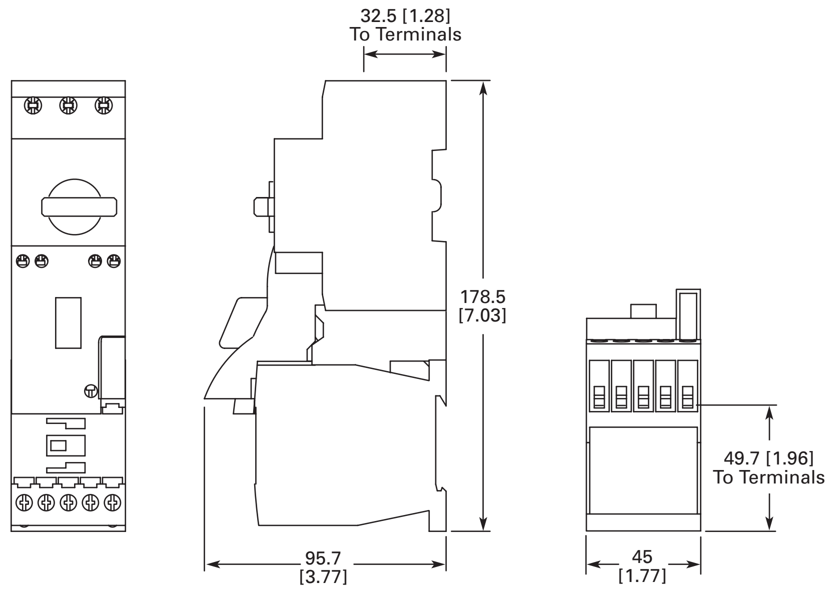


Figure 34-132. XTSC…BB_ — Approximate Dimensions in mm [in]

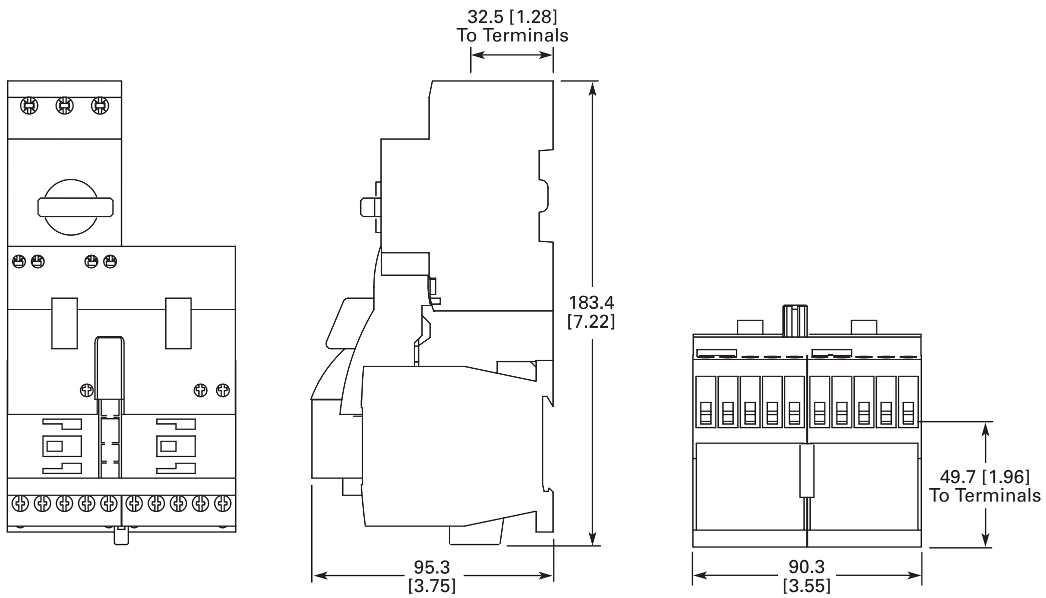


Figure 34-133. XTSR…BB_ — Approximate Dimensions in mm [in]

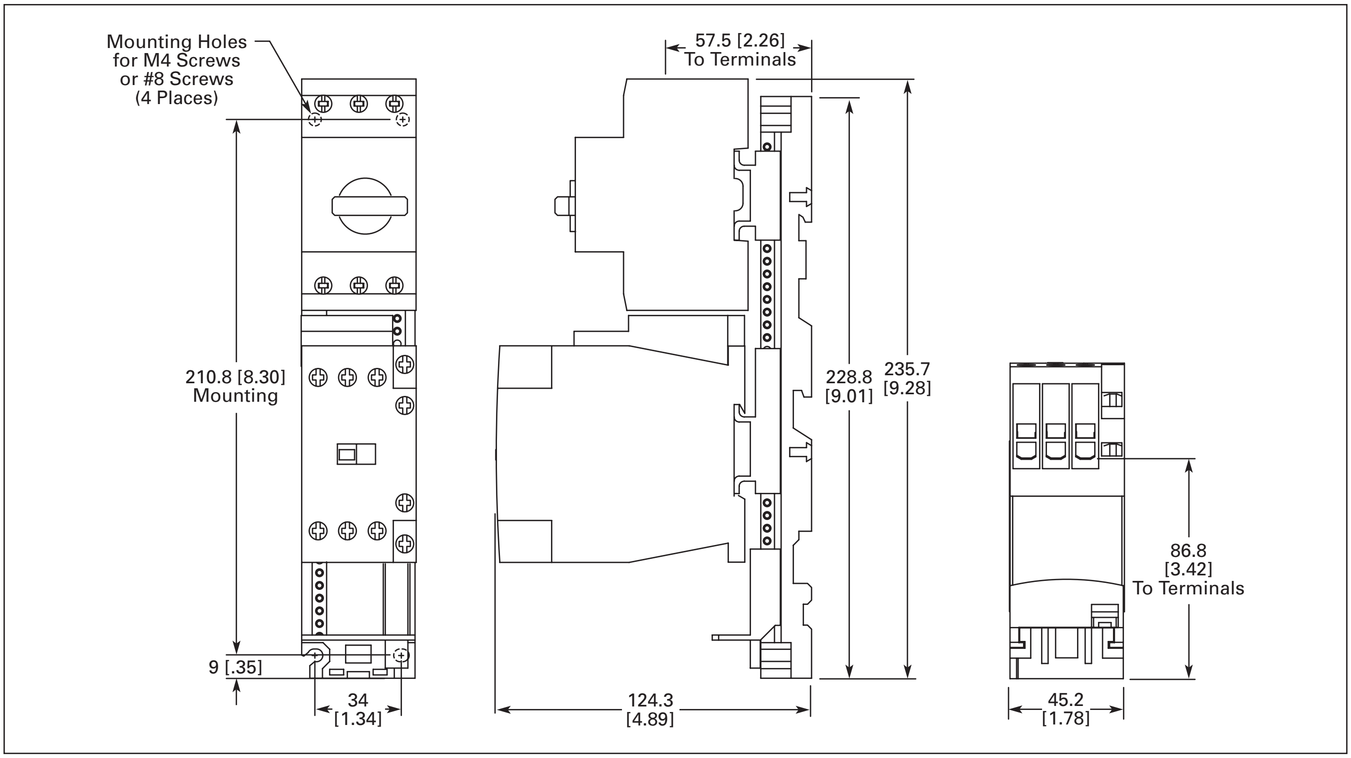


Figure 34-134. XTSC…BC_ — Approximate Dimensions in mm [in]

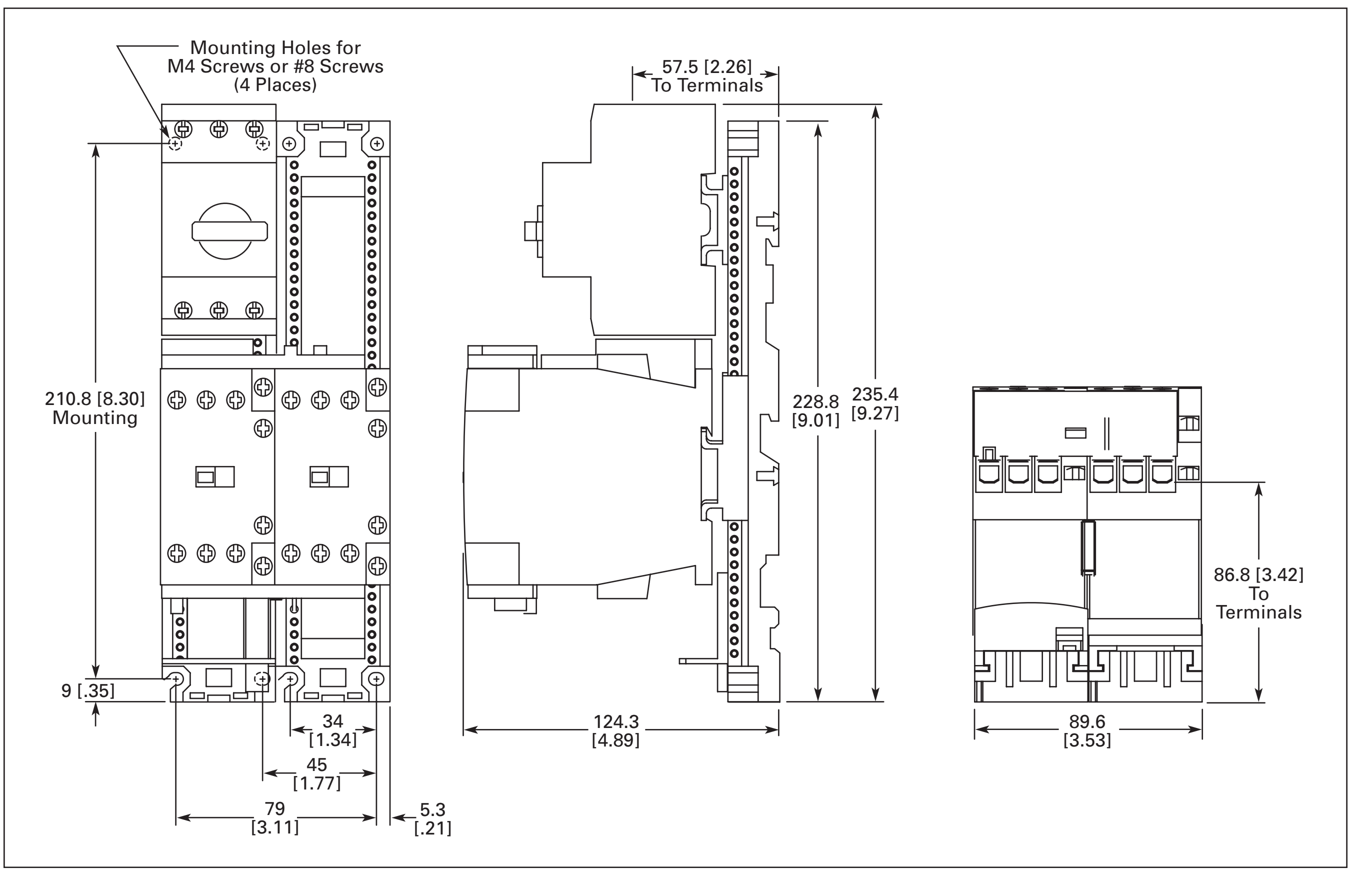


Figure 34-135. XTSR…BC_ — Approximate Dimensions in mm [in]

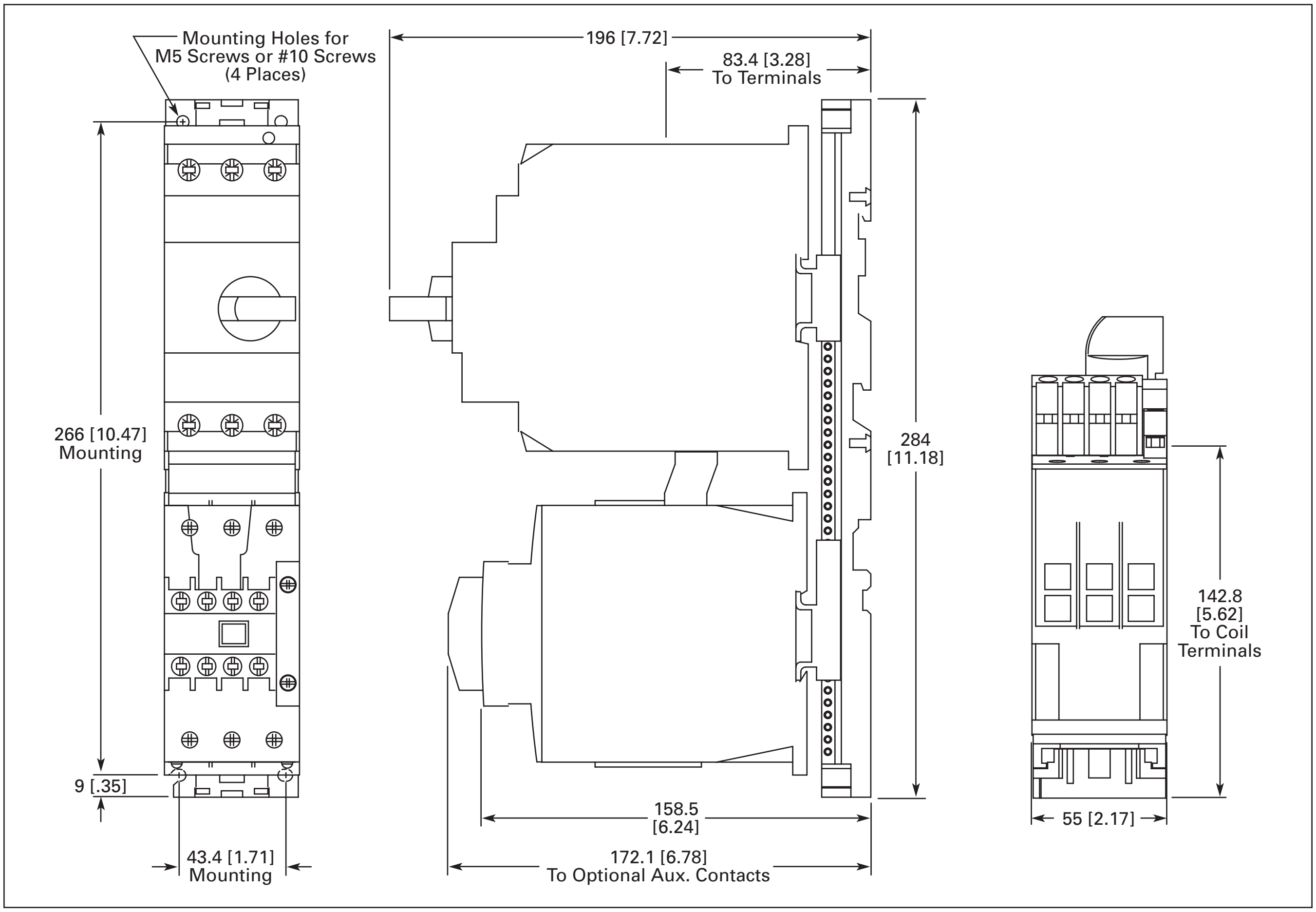


Figure 34-136. XTSC…DD_ — Approximate Dimensions in mm [in]

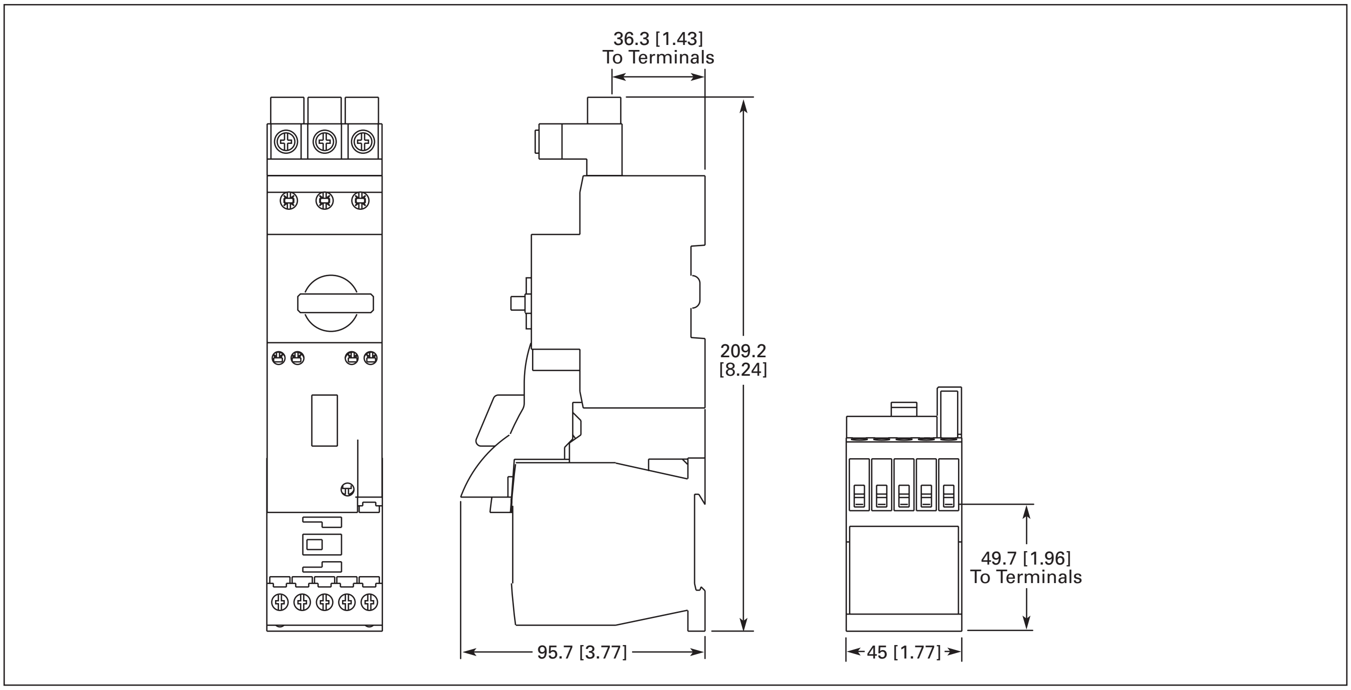


Figure 34-137. XTFC…BB_ — Approximate Dimensions in mm [in]

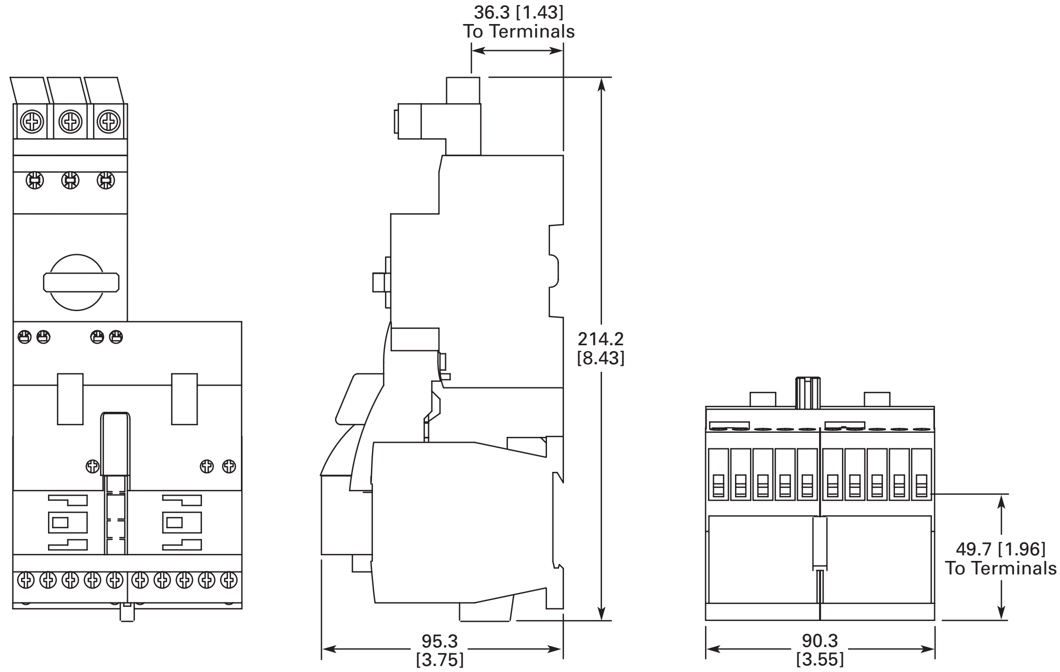


Figure 34-138. XTFR…BB_ — Approximate Dimensions in mm [in]

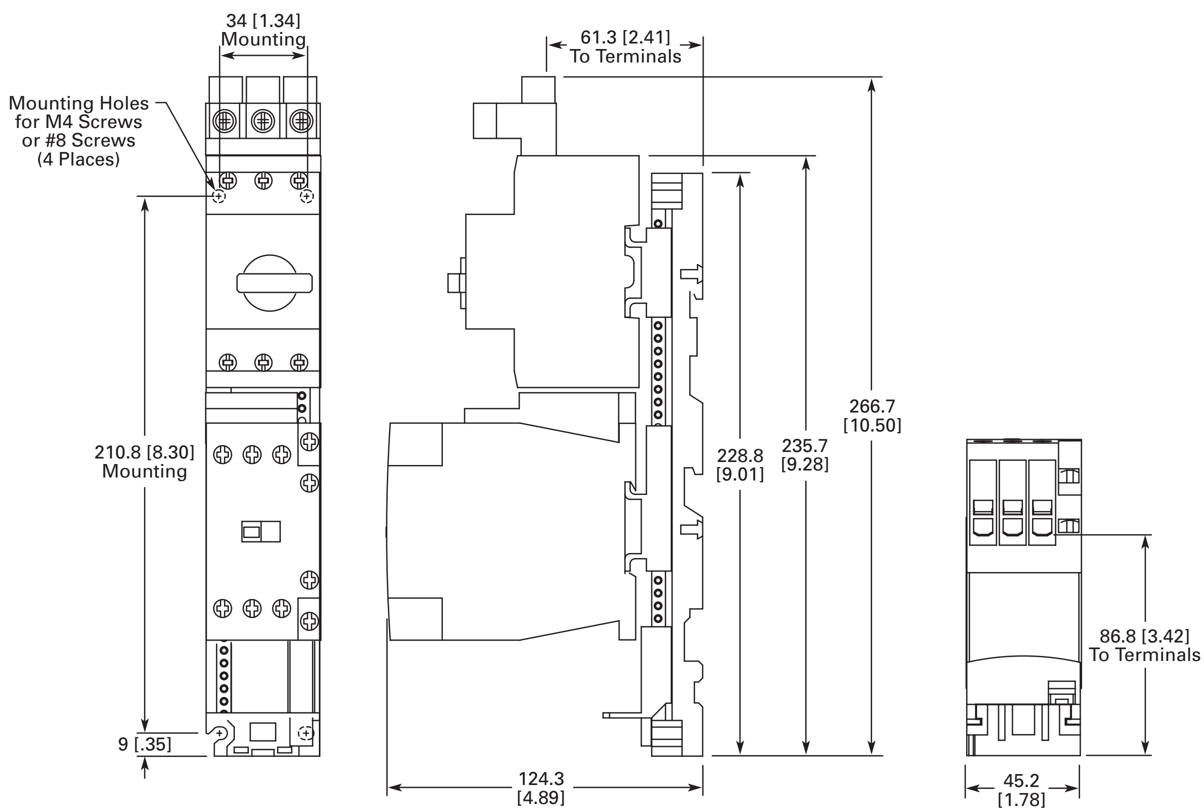


Figure 34-139. XTFC…BC_ — Approximate Dimensions in mm [in]

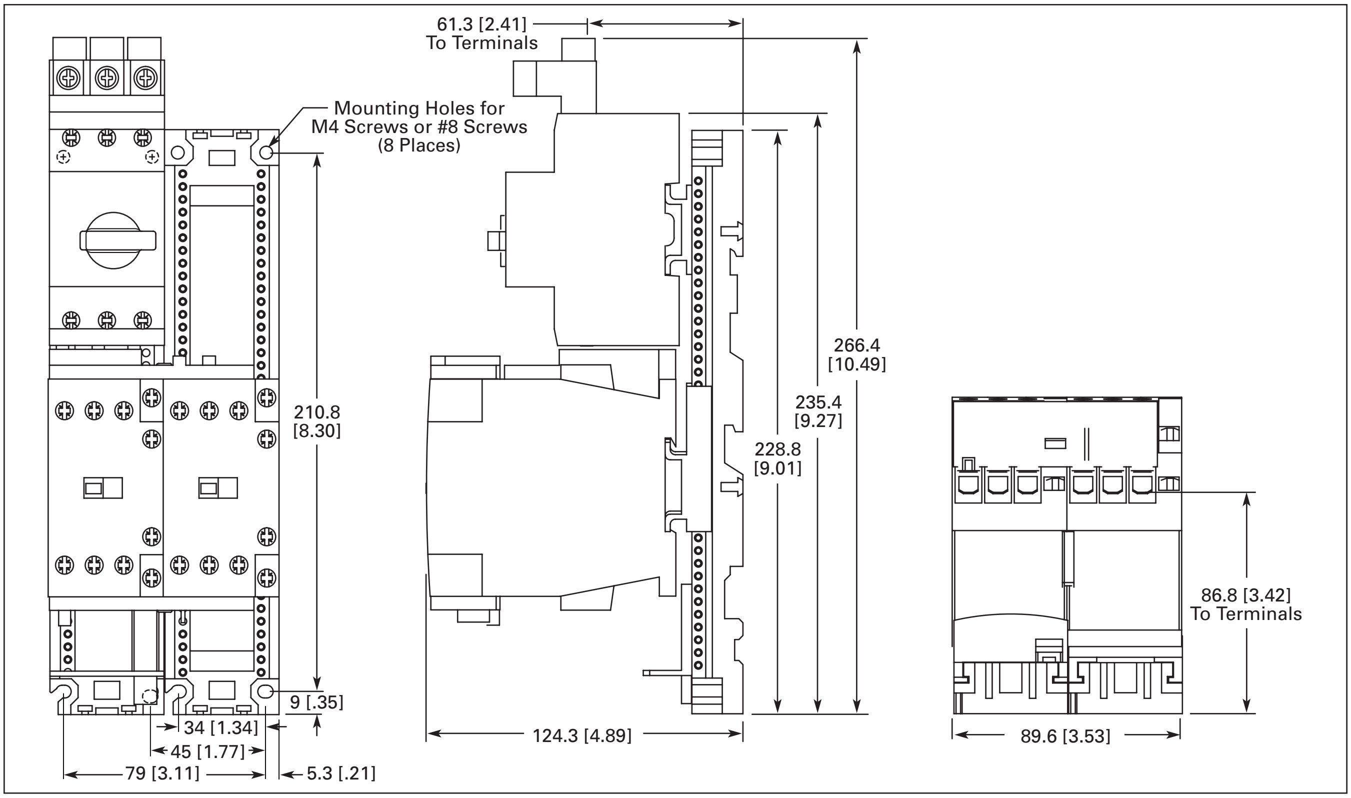


Figure 34-140. XTFR…BC_ — Approximate Dimensions in mm [in]

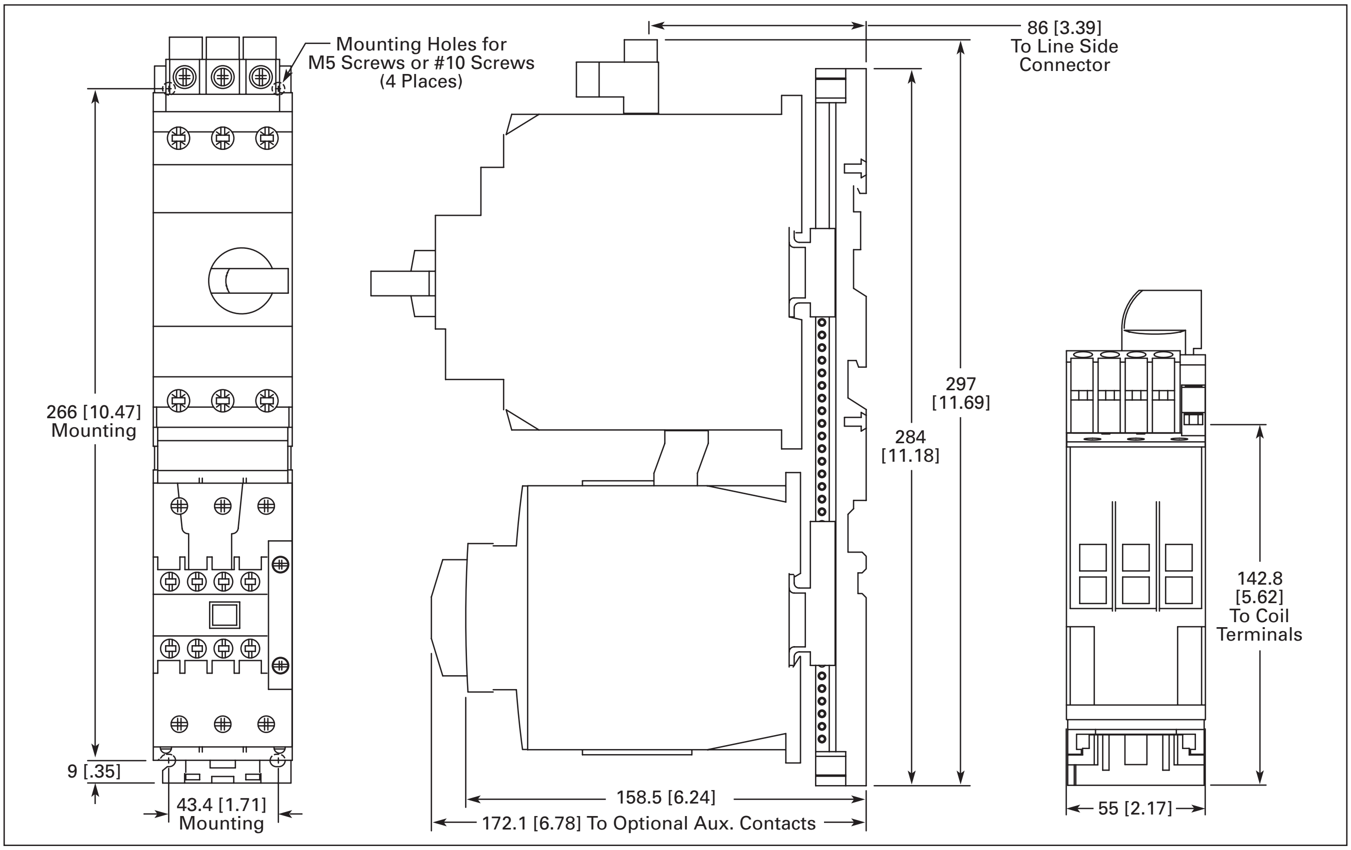


Figure 34-141. XTFC…DD_ — Approximate Dimensions in mm [in]

Approvals for World Markets

Overview

The ***XT*** line of products is approved for use throughout the world, including the USA and Canada. As such, they can be used without restriction as devices for world markets.

The majority of countries permit the import of devices on the manufacturer's undertaking that they have been constructed in accordance with the pertinent specifications. In the USA and Canada, however, there is a legal obligation to obtain official approval. In these countries, devices and enclosures — sometimes even complete control systems — are tested and approved by independent bodies.

In Europe, there also used to be a legal obligation to obtain official approval for low-voltage switchgear and controlgear. For industrial control gear, this legal obligation has now been abolished, provided the devices have been manufactured and tested in accordance with harmonized European standards (such as IEC/EN 60947). There is then no longer a requirement for them to carry their country's own approval mark.

Since January 1997, all devices must conform to the European Low-Voltage Directive and, where intended for sale within the European Union, must carry the CE mark.

Europe
Conformité Européen
(CE)

This mark denotes that the device carrying it conforms to all relevant requirements and specifications. The mandatory application of this mark therefore enables the unrestricted use of marked devices within the European economic area.

Since January 1996, all devices sold within the European union must comply with the Electromagnetic Compatibility (EMC) Directive. ***XT*** has passed the required tests to these Directives, and the devices carry the CE mark, demonstrating compliance with the EMC Directive. *Because devices bearing the CE mark comply with the harmonized standards, approval and the associated marking is no longer required in the following countries:*

Belgium
Comité Electrotechnique Belge
Belgisch Elektrotechnisch Comité
(CEBEC)

Denmark
Danmarks Elektriske Materielkontrol
(DEMKO)

Finland
(FIMKO)

France
Union Technique de l'Electricité
(UTE)

Netherlands
Naamloze Vennootschap tot Keuring van Electrotechnische Materialien
(KEMA)

Norway
Norges Elektriske Materiellkontrol
(NEMKO)

Sweden
Svenska Elektriska Materiel-Kontrollanstalten
(SEMKO)

Switzerland
Schweizerischer Elektrotechischer Verein
(SEV)

Devices the USA and Canada have UL and CSA approval.

USA
Underwriters Laboratories
(UL)

Listing

Recognition

Canada
Canadian Standards Association
(CSA)

Recently introduced is the mandatory approval of electrical products for:

- Slovakia
- Poland
- South Africa
- China
- Russia
- Turkey
- Argentina

Marking is partly mandatory for these countries. The IEC rating data is accepted as in other European countries.

Approval is not mandatory in the Czech Republic and Hungary. The manufacturer's declaration of conformity is sufficient here.

Romania requires that components that are to be used in public buildings must be approved by the Romanian test authority ICECON.

Russia
Devices for Russia must bear the appropriate marking.

Russia
Goststandart
(GOST-R)

South Africa
ZA
SABS

Argentina

Selection of Devices

"Selection appropriate for export" does not mean merely meeting the requisite approvals and conformity to relevant specifications. The meaning of the term goes a great deal further by even including that equipment and installations must be designed to a concept with export in mind.

The following are important criteria for selecting switchgear suitable for export:

- **For motor-protective circuit-breakers**
  Use inherently short-circuit proof switches capable of controlling the highest prospective fault levels at the point of installation without the need for back-up protection.
  - **Advantage:**
    - No restrictions whatsoever for installation
    - Complete independence from the on-site protective system
    - No problems getting spare parts
- **For circuit-breakers**
  Use types with visible contacts, quick-make and quick-break operation as standard. Use current-limiting circuit-breakers for high short-circuit levels. Selective switches are recommended for the selective graduation of networks.
  - **Advantage:**
    - Independence from local accident prevention regulations requiring visible contacts, and safety faults caused by inexperienced operating personnel.
    - The effects of short-circuits are kept to a minimum.
    - Fuseless installations offer greater safety and reliability in plant operation. In the event of a fault, only the faulty section of the system is isolated.
- **For contactors**
  Use contactors whose entire range provides consistently reliable operation in the event of voltage drops (consistently down to 80% U_n should be aimed for) and whose contact system will not assume an indeterminate position either on closing or on opening in such conditions.
  - **Advantage:**
    - During the electrification work in areas such as Africa and the Middle East, an insufficient voltage stability is — at least for a certain time — likely in many applications (for example due to long spur lines or small local generators). The use of devices that fulfill the above requirements will eliminate one of the main failure causes related to contactors.
- **For enclosures**
  Use insulated enclosures with transparent covers (i.e. "totally insulated" enclosures).
  - **Advantage:**
    - Total insulation is the best possible protective measure from the user's point of view, avoiding reliance on the possibly doubtful skills of unknown installation personnel. Furthermore, protective measures based on earthing are often extremely difficult, if not impossible (in the Middle East, for example, due to the dryness of the ground).
    - Insulated enclosures completely eliminate the need for any additional protection against corrosion. The transparent covers contribute significantly to the correct operation of a system, because switchgear operation can be monitored even with the doors or covers closed, thus virtually eliminating the possibility of these being left open through carelessness. The transparent cover is an important contribution to safety, especially where exports to areas of uncertain skills are concerned.
- **For overcurrent protective devices**
  Always use circuit-breakers and motor-protective circuit-breakers. Avoid fuses as far as possible.
  - **Advantage:**
    - The operational reliability of a system is especially important for export contracts. Circuit-breakers and motor-protective circuit-breakers provide this reliability in full measure since they can be immediately reclosed once a fault has been cleared, they disconnect all poles, they have ideal protection through high tripping accuracy and they can be used for selective operation. Because they have no fuses or other consumables, they also greatly reduce the problem of obtaining replacement parts. The advantages of fuseless design for export are especially evident in this case. No complicated investigation is needed to find out which fusing system is used in the respective location and which specifications have to be followed to select the correct fuses. Often several different fuse systems with widely varying characteristics are used side-by-side in the same country. For the uninitiated, it may be almost impossible to find the right fuse in these circumstances. These problems do not arise where a circuit-breaker is used.
- **For main switches and safety switches**
  Use devices with positive contact separation and clear switch position indication.
  - **Advantage:**
    - The mechanical coupling of the actuating element with the contacts ensues that the OFF position is indicated only when all main contacts are separated by the prescribed distance, and only in this position can the switch be padlocked. This ensures safety when carrying out maintenance and repair work on the installation or machinery.

Test Authorities

USA
USA
UL

Canada
CDN
CSA

Romania
RO
ICECON
ML PAT

Russia
RUS
GOST-R

South Africa
ZA
SABS

Slovakia
SK
SKTC

Poland
PL
BBJ-SEP

Turkey
TR
TSE

China
PRC
CCC

Ukraine
UA
Ukrain-GOST

Shipping Classifications

Germany
Germanischer Lloyd (GL)

Great Britain
Lloyd's Register of Shipping (LR)

France
Bureau Veritas (BV)

Russia
Russian Maritime Register of Shipping (RS)

Italy
Registro Italiano Navale (RINA)

Norway
Det Norske Veritas (DNV)

Poland
Polski Rejestr Statkow (PRS)

Approvals for North America

In the USA, the legally established OSHA (Occupational Safety and Health Act) and the NEC (National Electrical Code) require the use of approved devices and systems.

In Canada, all electrical apparatus must comply with the CEC (Canadian Electrical Code), requires that all equipment and installations have CSA approval.

In addition to the normal UL and CSA approvals, the trade regulations originating from the NAFTA agreements allow the application for a joint UL and CSA approval. The devices then carry a logo that is recognized in both countries.

Some local inspectors and end users still refuse to accept the joint listing.

Table 34-260. Approvals for North America

Type of Approval	Approval Mark
The device is UL- and CSA-approved as discrete device.	UL ® CSA
The device is CSA-approved as discrete device.	CSA
The device is UL-approved as discrete device.	UL ®
The device contains UL-approved components; its approval conditions must be maintained in use (UL Recognized). The device is CSA-approved as discrete device.	UL Recognized, CSA

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IEC Utilization Categories

(See also IEC/EN 60947-1; 2.1.18/IEV 441-17-19)

A combination of specified requirements relating to the condition in which the switching device or fuse fulfills its purpose and selected to represent a characteristic group of real-life applications. The specified requirements may, for example, relate to the values of making and breaking capacity and other characteristic values, data concerning associated circuits and the applicable conditions of use and operational behavior.

Table 34-261. Used in Technical Data & Formula⑲

Code	Descriptions
DF	Duty factory
$I_{\Delta n}$	Response value of earth-fault release
I_{cm}	Rated short-circuit making capacity
I_{cn}	Rated short-circuit breaking capacity
I_{cs}	Rated service short-circuit breaking capacity
I_{cu}	Rated ultimate short-circuit breaking capacity
I_{cw}	Rated short-time withstand current
I_e	Rated operational current
I_k	Transformer initial short-circuit AC current
I_L	Load monitoring response value
I_n	Rated current
I_{NT}	Transformer rated current
I_{PK}	Rated peak withstand current
I_q	Rated conditional short-circuit current
I_r	Overcurrent release set value
I_{rm}	Response value of non-delayed short-circuit release
I_i	Response value of non-delayed short-circuit release
I_{rmf}	Response value of fixed, non-delayed short-circuit release
I_{rmv}	Response value of short-time delayed short-circuit release
I_{sd}	Response value of short-time delayed short-circuit release
I_T	Response value of earth-fault release
I_g	Response value of earth-fault release
I_{th}	Conventional free air thermal current
I_{the}	Conventional thermal current of enclosed devices
I_u	Rated uninterrupted current
S_{NT}	Transformer rating
t_r	Time delay of overload release response
t_T	Time delay of earth-fault release response
t_g	Time delay of earth-fault release response
t_v	Time delay of short-circuit release response
U_c	Rated actuating voltage
U_e	Rated operational voltage
U_i	Rated insulation voltage
U_{imp}	Rated impulse withstand voltage
U_k	Transformer short-circuit voltage
U_s	Rated control voltage

Annex A (informative)

Table 34-262. Examples of Utilization Categories for Low-Voltage Switchgear and Controlgear ①

Category	Typical Applications	Relevant IEC Product Standard
Nature of Current — AC		
AC-1	Non-inductive or slightly inductive loads, resistance furnaces	60947-4-1
AC-2	Slip-ring motors: starting, switching off	60947-4-1
AC-3	Squirrel-cage motors: starting, switching off motors during running	60947-4-1
AC-4	Squirrel-cage motors: starting, plugging ②, inching ③	60947-4-1
AC-5a	Switching of electric discharge lamp controls	60947-4-1
AC-5b	Switching of incandescent lamps	60947-4-1
AC-6a	Switching of transformers	60947-4-1
AC-6b	Switching of capacitor banks	60947-4-1
AC-7a	Slightly inductive loads for household appliances and similar applications	61095
AC-7b	Motor-loads for household applications	61095
AC-8a	Hermetic refrigerant compressor motor control with manual resetting of overload releases	60947-4-1
AC-8b	Hermetic refrigerant compressor motor control with automatic resetting of overload releases	60947-4-1
AC-12	Control of resistive loads and solid-state loads with isolation by optocouplers	60947-5-1
AC-12	Control of resistive loads and solid-state loads with optical isolation	60947-5-2
AC-13	Control of solid-state loads with transformer isolation	60947-5-1
AC-14	Control of small electromagnetic loads	60947-5-1
AC-15	Control of AC electromagnetic loads	60947-5-1
AC-20	Connecting and disconnecting under no-load conditions	60947-3
AC-21	Switching of resistive loads, including moderate overloads	60947-3
AC-22	Switching of mixed resistive and inductive loads, including moderate overloads	60947-3
AC-23	Switching of motor loads or other highly inductive loads	60947-3

① 60947-1 © IEC: 2004.
② By plugging is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.
③ By inching (jogging) is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

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Annex A (informative)

Table 34-262. Examples of Utilization Categories for Low-Voltage Switchgear and Controlgear ① (Continued)

Category	Typical Applications	Relevant IEC Product Standard
Nature of Current — AC (Continued)		
AC-31	Non inductive or slightly inductive loads	60947-6-1
AC-33	Motor loads or mixed loads including motors, resistive loads and up to 30% incandescent lamp loads	60947-6-1
AC-35	Electric discharge lamp loads	60947-6-1
AC-36	Incandescent lamp loads	60947-6-1
AC-40	Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance	60947-6-2
AC-41	Non-inductive or slightly inductive loads, resistance furnaces	60947-6-2
AC-42	Slip-ring motors: starting, switching off	60947-6-2
AC-43	Squirrel-cage motors: starting, switching off motors during running	60947-6-2
AC-44	Squirrel-cage motors: starting, plugging ②, inching ③	60947-6-2
AC-45a	Switching of electric discharge lamp controls	60947-6-2
AC-45b	Switching of incandescent lamps	60947-6-2
AC-51	Non-inductive or slightly inductive loads, resistance furnaces	60947-4-3
AC-52a	Control of slip ring motor stators: 8 h duty with on-load currents for start, acceleration, run	60947-4-2
AC-52b	Control of slip ring motor stators: intermittent duty	60947-4-2
AC-53a	Control of squirrel-cage motors: 8 h duty with on-load currents for start, acceleration, run	60947-4-2
AC-53b	Control of squirrel-cage motors: intermittent duty	60947-4-2
AC-55a	Switching of electric discharge lamp controls	60947-4-3
AC-55b	Switching of incandescent lamps	60947-4-3
AC-56a	Switching of transformers	60947-4-3
AC-56b	Switching of capacitor banks	60947-4-3
AC-58a	Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: 8 h duty with on-load currents for start, acceleration, run	60947-4-2
AC-58b	Control of hermetic refrigerant compressor motors with automatic resetting of overload releases: intermittent duty	60947-4-2
AC-140	Control of small electromagnetic loads with holding (closed) current ≤ 0,2 A, e.g. contactor relays	60947-5-2
Nature of Current — AC and DC		
A	Protection of circuits, with no rated short-time withstand current	60947-2
B	Protection of circuits, with a rated short-time withstand current	60947-2
Nature of Current — DC		
DC-1	Non-inductive or slightly inductive loads, resistance furnaces	60947-4-1
DC-3	Shunt-motors: starting, plugging ②, inching ③, Dynamic breaking of motors	60947-4-1
DC-5	Series-motors: starting, plugging ②, inching ③, Dynamic breaking of motors	60947-4-1
DC-6	Switching of incandescent lamps	60947-4-1
DC-12	Control of resistive loads and solid-state loads with isolation by optocouplers	60947-5-1
DC-12	Control of resistive loads and solid-state loads with optical isolation	60947-5-2
DC-13	Control of electromagnets	60947-5-1
DC-13	Control of electromagnets	60947-5-2
DC-14	Control of electromagnetic loads having economy resistors in circuit	60947-5-1
DC-20	Connecting and disconnecting under no-load conditions	60947-3
DC-21	Switching of resistive loads, including moderate overloads	60947-3
DC-22	Switching of mixed resistive and inductive loads, including moderate overloads (e.g. shunt motors)	60947-3
DC-23	Switching of motor loads or other highly inductive loads (e.g. series motors)	60947-3
DC-31	Resistive loads	60947-6-1
DC-33	Motor loads or mixed loads including motors	60947-6-1
DC-36	Incandescent lamp loads	60947-6-1
DC-40	Distribution circuits comprising mixed resistive and reactive loads having a resultant inductive reactance	60947-6-2
DC-41	Non-inductive or slightly inductive loads, resistance furnaces	60947-6-2
DC-43	Shunt-motors: starting, plugging ②, inching ③, Dynamic breaking of DC	60947-6-2
DC-45	Series-motors: starting, plugging ②, inching ③, Dynamic breaking of DC	60947-6-2
DC-46	Switching of incandescent lamps	60947-6-2

① 60947-1 © IEC: 2004.
② By plugging is understood stopping or reversing the motor rapidly by reversing motor primary connections while the motor is running.
③ By inching (jogging) is understood energizing a motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

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Motor Ratings Data

Ampere Rating of AC and DC Motors

Ampere ratings of motors vary somewhat, depending upon the type of motor. The values given below are for drip-proof, Class B insulated (T Frame) where available, 1.15 service factor, NEMA Design B motors. These values represent an average full load motor current which was calculated from the motor performance data published by several motor manufacturers. In the case of high torque squirrel cage motors, the ampere ratings will be at least 10% greater than the values given below.

Caution — These average ratings could be high or low for a specific motor and therefore heater coil selection on this basis always involves risk. For fully reliable motor protection, select heater coils on the basis of full load current rating as shown on the motor nameplate.

Ampere Ratings of Three-Phase, 60 Hz, AC Induction Motor

hp	Syn. Speed RPM	Current in Amperes					
		200V	230V	380V ①	460V	575V	2200V
1/4	1800	1.09	.95	.55	.48	.38	—
	1200	1.61	1.40	.81	.70	.56	—
	900	1.84	1.60	.93	.80	.64	—
1/3	1800	1.37	1.19	.69	.60	.48	—
	1200	1.83	1.59	.92	.80	.64	—
	900	2.07	1.80	1.04	.90	.72	—
1/2	1800	1.98	1.72	.99	.86	.69	—
	1200	2.47	2.15	1.24	1.08	.86	—
	900	2.74	2.38	1.38	1.19	.95	—
3/4	1800	2.83	2.46	1.42	1.23	.98	—
	1200	3.36	2.92	1.69	1.46	1.17	—
	900	3.75	3.26	1.88	1.63	1.30	—
1	3600	3.22	2.80	1.70	1.40	1.12	—
	1800	4.09	3.56	2.06	1.78	1.42	—
	1200	4.32	3.76	2.28	1.88	1.50	—
	900	4.95	4.30	2.60	2.15	1.72	—
1-1/2	3600	5.01	4.36	2.64	2.18	1.74	—
	1800	5.59	4.86	2.94	2.43	1.94	—
	1200	6.07	5.28	3.20	2.64	2.11	—
	900	6.44	5.60	3.39	2.80	2.24	—
2	3600	6.44	5.60	3.39	2.80	2.24	—
	1800	7.36	6.40	3.87	3.20	2.56	—
	1200	7.87	6.84	4.14	3.42	2.74	—
	900	9.09	7.90	4.77	3.95	3.16	—
3	3600	9.59	8.34	5.02	4.17	3.34	—
	1800	10.8	9.40	5.70	4.70	3.76	—
	1200	11.7	10.2	6.20	5.12	4.10	—
	900	13.1	11.4	6.90	5.70	4.55	—
5	3600	15.5	13.5	8.20	6.76	5.41	—
	1800	16.6	14.4	8.74	7.21	5.78	—
	1200	18.2	15.8	9.59	7.91	6.32	—
	900	18.3	15.9	9.60	7.92	6.33	—
7-1/2	3600	22.4	19.5	11.8	9.79	7.81	—
	1800	24.7	21.5	13.0	10.7	8.55	—
	1200	25.1	21.8	13.2	10.9	8.70	—
	900	26.5	23.0	13.9	11.5	9.19	—
10	3600	29.2	25.4	15.4	12.7	10.1	—
	1800	30.8	26.8	16.3	13.4	10.7	—
	1200	32.2	28.0	16.9	14.0	11.2	—
	900	35.1	30.5	18.5	15.2	12.2	—
15	3600	41.9	36.4	22.0	18.2	14.5	—
	1800	45.1	39.2	23.7	19.6	15.7	—
	1200	47.6	41.4	25.0	20.7	16.5	—
	900	51.2	44.5	26.9	22.2	17.8	—
20	3600	58.0	50.4	30.5	25.2	20.1	—
	1800	58.9	51.2	31.0	25.6	20.5	—
	1200	60.7	52.8	31.9	26.4	21.1	—
	900	63.1	54.9	33.2	27.4	21.9	—
25	3600	69.9	60.8	36.8	30.4	24.3	—
	1800	74.5	64.8	39.2	32.4	25.9	—
	1200	75.4	65.6	39.6	32.8	26.2	—
	900	77.4	67.3	40.7	33.7	27.0	—
30	3600	84.8	73.7	44.4	36.8	29.4	—
	1800	86.9	75.6	45.7	37.8	30.2	—
	1200	90.6	78.8	47.6	39.4	31.5	—
	900	94.1	81.8	49.5	40.9	32.7	—
40	3600	111	96.4	58.2	48.2	38.5	—
	1800	116	101	61.0	50.4	40.3	—
	1200	117	102	61.2	50.6	40.4	—
	900	121	105	63.2	52.2	41.7	—
50	3600	138	120	72.9	60.1	48.2	—
	1800	143	124	75.2	62.2	49.7	—
	1200	145	126	76.2	63.0	50.4	—
	900	150	130	78.5	65.0	52.0	—
60	3600	164	143	86.8	71.7	57.3	—
	1800	171	140	90.0	74.5	59.4	—
	1200	173	150	91.0	75.0	60.0	—
	900	177	154	93.1	77.0	61.5	—
75	3600	206	179	108	89.6	71.7	—
	1800	210	183	111	91.6	73.2	—
	1200	212	184	112	92.0	73.5	—
	900	222	193	117	96.5	77.5	—
100	3600	266	231	140	115	92.2	—
	1800	271	236	144	118	94.8	23.6
	1200	275	239	145	120	95.6	24.2
	900	290	252	153	126	101	24.8
125	3600	—	292	176	146	116	—
	1800	—	293	177	147	117	29.2
	1200	—	298	180	149	119	29.9
	900	—	305	186	153	122	30.9
150	3600	—	343	208	171	137	—
	1800	—	348	210	174	139	34.8
	1200	—	350	210	174	139	35.5
	900	—	365	211	183	146	37.0
200	3600	—	452	257	226	181	—
	1800	—	458	265	229	184	46.7
	1200	—	460	266	230	184	47.0
	900	—	482	279	241	193	49.4
250	3600	—	559	338	279	223	—
	1800	—	568	343	284	227	57.5
	1200	—	573	345	287	229	58.5
	900	—	600	347	300	240	60.5
300	1800	—	678	392	339	271	69.0
	1200	—	684	395	342	274	70.0
400	1800	—	896	518	448	358	91.8
500	1800	—	1110	642	555	444	116

① 380V 50 Hz.

Single-Phase AC Motors

Table 430.248. **Full-Load Currents in Amperes, Single-Phase Alternating-Current Motors**
The following values of full-load currents are for motors running at usual speeds and motors with normal torque characteristics. Motors built for especially low speeds or high torques may have higher full-load currents and multispeed motors will have full-load current varying with speed, in which case the nameplate current ratings shall be used.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120 and 220 to 240V.

hp	115V	200V	208V	230V
1/6	4.4	2.5	2.4	2.2
1/4	5.8	3.3	3.2	2.9
1/3	7.2	4.1	4.0	3.6
1/2	9.8	5.6	5.4	4.9
3/4	13.8	7.9	7.6	6.9
1	16	9.2	8.8	8
1-1/2	20	11.5	11	10
2	24	13.8	13.2	12
3	34	19.6	18.7	17
5	56	32.2	30.8	28
7-1/2	80	46	44	40
10	100	57.5	55	50

DC Motors

Table 430.247. **Full-Load Current in Amperes, Direct-Current Motors**
The following values of full-load currents are for motors running at base speed.

Note: These are average direct-current quantities.

hp	Armature Voltage Rating ②		Ampere Capacity of Fuses for Motors — Recommended Values	
	120V	240V	120V	240V
1/4	3.1	1.6	5	3
1/3	4.1	2.0	5	3
1/2	5.4	2.7	7	3
3/4	7.6	3.8	10	5
1	9.5	4.7	15	7
1-1/2	13.2	6.6	20	10
2	17	8.5	25	12
3	25	12.2	30	15
5	40	20	50	25
7-1/2	58	29	80	40
10	76	38	100	50
15	—	55	—	75
20	—	72	—	100
25	—	89	—	125
30	—	106	—	150
40	—	140	—	200
50	—	173	—	250
60	—	206	—	275
75	—	255	—	350
100	—	341	—	500
125	—	425	—	600
150	—	506	—	—
200	—	675	—	—

② These are average direct-current quantities.

Three-Phase AC Motors

The following values of full-load currents are typical for motors running at speeds usual for belted motors and motors with normal torque characteristics.

Motors built for low speeds (1,200 RPM or less) or high torques may require more running current and multispeed motors will have full-load current varying with speed. In these cases the nameplate current rating shall be used.

The voltages listed are rated motor voltages. The currents listed shall be permitted for system voltage ranges of 110 to 120, 220 to 240, 440 to 480 and 550 to 600V.

Table 430.250. **Full-Load Current Three-Phase Alternating-Current Motors**

hp	Induction Type Squirrel-Cage and Wound-Rotor Amperes							Synchronous Type Unity Power Factor ① Amperes			
	115V	200V	208V	230V	460V	575V	2300V	230V	460V	575V	2300V
1/2	4.4	2.5	2.4	2.2	1.1	.9	—	—	—	—	—
3/4	6.4	3.7	3.5	3.2	1.6	1.3	—	—	—	—	—
1	8.4	4.8	4.6	4.2	2.1	1.7	—	—	—	—	—
1-1/2	12.0	6.9	6.6	6.0	3.0	2.4	—	—	—	—	—
2	13.6	7.8	7.5	6.8	3.4	2.7	—	—	—	—	—
3	—	11.0	10.6	9.6	4.8	3.9	—	—	—	—	—
5	—	17.5	16.7	15.2	7.6	6.1	—	—	—	—	—
7-1/2	—	25.3	24.2	22	11	9	—	—	—	—	—
10	—	32.2	30.8	28	14	11	—	—	—	—	—
15	—	48.3	46.2	42	21	17	—	—	—	—	—
20	—	62.1	59.4	54	27	22	—	—	—	—	—
25	—	78.2	74.8	68	34	27	—	53	26	21	—
30	—	92	88	80	40	32	—	63	32	26	—
40	—	120	114	104	52	41	—	83	41	33	—
50	—	150	143	130	65	52	—	104	52	42	—
60	—	177	169	154	77	62	16	123	61	49	12
75	—	221	211	192	96	77	20	155	78	62	15
100	—	285	273	248	124	99	26	202	101	81	20
125	—	359	343	312	156	125	31	253	126	101	25
150	—	414	396	360	180	144	37	302	151	121	30
200	—	552	528	480	240	192	49	400	201	161	40
250	—	—	—	—	302	242	60	—	—	—	—
300	—	—	—	—	361	289	72	—	—	—	—
350	—	—	—	—	414	336	83	—	—	—	—
400	—	—	—	—	477	382	95	—	—	—	—
450	—	—	—	—	515	412	103	—	—	—	—
500	—	—	—	—	590	472	118	—	—	—	—

① For 90 and 80 percent power factor, the above figures shall be multiplied by 1.1 and 1.25 respectively.

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Ampacities of Insulated Conductors (Based on 2005 NEC ①)

Table 310.16. **Allowable Ampacities of Insulated Conductors Rated 0 – 2000V, 60° – 90°C (140° – 194°F), Not More Than Three Current-Carrying Conductors in Raceway or Cable or Earth (Directly Buried), Based on Ambient Temperature of 30°C (86°F)**

Size	Temperature Rating of Conductor. See NEC Table 310-13.						Size
AWG kcmil	60°C (140°F)	75°C (167°F)	90°C (194°F)	60°C (140°F)	75°C (167°F)	90°C (194°F)	AWG kcmil
	Types TW†, UF†	Types FEPW†, RH†, RHW†, THHW†, THW†, THWN†, XHHW†, USE†, ZW†	Types TBS, SA, SIS, FEP†, FEPB†, MI, RHH†, RHW-2, THHN†, THHW†, THW-2†, THWN-2†, USE-2, XHH, XHHW†, XHHW-2, ZW-2	Types TW†, UF†	Types RH†, RHW†, THHW†, THW†, THWN†, XHHW†, USE†	Types TBS, SA, SIS, THHN†, THHW†, THW-2, THWN-2, RHH†, RHW-2, USE-2, XHH, XHHW, XHHW-2, ZW-2	
	Copper			Aluminum or Copper-Clad Aluminum			
18	—	—	14	—	—	—	—
16	—	—	18	—	—	—	—
14	20†	20†	25†	—	—	—	—
12	25†	25†	30†	20†	20†	25†	12
10	30	35†	40†	25	30†	35†	10
8	40	50	55	30	40	45	8
6	55	65	75	40	50	60	6
4	70	85	95	55	65	75	4
3	85	100	110	65	75	85	3
2	95	115	130	75	90	100	2
1	110	130	150	85	100	115	1
1/0	125	150	170	100	120	135	1/0
2/0	145	175	195	115	135	150	2/0
3/0	165	200	225	130	155	175	3/0
4/0	195	230	260	150	180	205	4/0
250	215	255	290	170	205	230	250
300	240	285	320	190	230	255	300
350	260	310	350	210	250	280	350
400	280	335	380	225	270	305	400
500	320	380	430	260	310	350	500
600	355	420	475	285	340	385	600
700	385	460	520	310	375	420	700
750	400	475	535	320	385	435	750
800	410	490	555	330	395	450	800
900	435	520	585	355	425	480	900
1000	455	545	615	375	445	500	1000
1250	495	590	665	405	485	545	1250
1500	520	625	705	435	520	585	1500
1750	545	650	735	455	545	615	1750
2000	560	665	750	470	560	630	2000

Correction Factors

Ambient Temp. °C	For Ambient Temperatures Other Than 30°C (86°F), Multiply the Allowable Ampacities Shown Above by the Appropriate Factor Shown Below						Ambient Temp. °F
21 – 25	1.08	1.05	1.04	1.08	1.05	1.04	70 – 77
26 – 30	1.00	1.00	1.00	1.00	1.00	1.00	78 – 86
31 – 35	.91	.94	.96	.91	.94	.96	87 – 95
36 – 40	.82	.88	.91	.82	.88	.91	96 – 104
41 – 45	.71	.82	.87	.71	.82	.87	105 – 113
46 – 50	.58	.75	.82	.58	.75	.82	114 – 122
51 – 55	.41	.67	.76	.41	.67	.76	123 – 131
56 – 60	—	.58	.71	—	.58	.71	132 – 140
61 – 70	—	.33	.58	—	.33	.58	141 – 158
71 – 80	—	—	.41	—	—	.41	159 – 176

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† Unless otherwise specifically permitted elsewhere in this *Code*, the overcurrent protection for conductor types marked with an obelisk (†) shall not exceed 15A for No. 14, 20A for No. 12 and 30A for No. 10 copper; or 15A for No. 12 and 25A for No. 10 aluminum and copper-clad aluminum after any correction factors for ambient temperature and number of conductors have been applied.

Table 310.15 (B)(z)(a). **Adjustment Factor for More Than Three Current-Carrying Conductors in Raceway or Cable**

Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacities shall be reduced as shown in the following table:

Number of Current-Carrying Conductors	Percent of Values in Tables as Adjusted for Ambient Temperature if Necessary
4 – 6	80
7 – 9	70
10 – 20	50
21 – 30	45
31 – 40	40
41 and above	35

Where single conductors or multiconductor cables are stacked or bundled longer than 24 in. (610 mm) without maintaining spacing and are not installed in raceways, the allowable ampacity of each conductor shall be reduced as shown in the above table.

Ampacities of Insulated Conductors (Based on 2005 NEC ①) — Continued

Table 310.18. **Allowable Ampacities of Three Single Insulated Conductors Rated 0 – 2000V, 150° – 250°C (302° – 482°F), in Raceway or Cable Based on Ambient Air Temperature of 40°C (104°F)**

Size	Temperature Rating of Conductor. See NEC Table 310-13.				Size
AWG kcmil	150°C (302°F)	200°C (392°F)	250°C (482°F)	150°C (302°F)	AWG kcmil
	Type Z	Types FEP, FEPB, PFA	Types PFAH, TFE	Type Z	
	Copper		Nickel or Nickel-Coated Copper	Aluminum or Copper-Clad Aluminum	
14	34	36	39	—	14
12	43	45	54	30	12
10	55	60	73	44	10
8	76	83	93	57	8
6	96	110	117	75	6
4	120	125	148	94	4
3	143	152	166	109	3
2	160	171	191	124	2
1	186	197	215	145	1
1/0	215	229	244	169	1/0
2/0	251	260	273	198	2/0
3/0	288	297	308	227	3/0
4/0	332	346	361	260	4/0
250	—	—	—	—	250
300	—	—	—	—	300
350	—	—	—	—	350
400	—	—	—	—	400
500	—	—	—	—	500
600	—	—	—	—	600
700	—	—	—	—	700
750	—	—	—	—	750
800	—	—	—	—	800
1000	—	—	—	—	1000
1500	—	—	—	—	1500
2000	—	—	—	—	2000

Correction Factors

Ambient Temp. °C	For Ambient Temperatures Other Than 40°C (104°F), Multiply the Allowable Ampacities Shown Above By the Appropriate Factor Shown Below				Ambient Temp. °F
41 – 50	.95	.97	.98	.95	105 – 122
51 – 60	.90	.94	.95	.90	123 – 140
61 – 70	.85	.90	.93	.85	141 – 158
71 – 80	.80	.87	.90	.80	159 – 176
81 – 90	.74	.83	.87	.74	177 – 194
91 – 100	.67	.79	.85	.67	195 – 212
101 – 120	.52	.71	.79	.52	213 – 248
121 – 140	.30	.61	.72	.30	249 – 284
141 – 160	—	.50	.65	—	285 – 320
161 – 180	—	.35	.58	—	321 – 356
181 – 200	—	—	.49	—	357 – 392
201 – 225	—	—	.35	—	393 – 437

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34

Enclosure Ratings

The UL, NEMA and IEC organizations (and other international groups) define degrees of protection provided by electrical enclosures with respect to personnel, equipment within the housing and the ingress of water.

Subtle differences do exist between the test procedures and specifications of these organizations.

To claim ratings to NEMA specifications, the testing is performed and certified by the manufacturers themselves.

To comply to UL and IEC specifications, the manufacturers must submit product samples, materials used and other data to an independent testing laboratory before ratings can be claimed.

In addition, IEC "IP" ratings differ from NEMA in that they do not apply to protection against the risk of explosion or conditions such as humidity, corrosive gases, fungi or vermin. In addition, different parts of the equipment can have different degrees of protection and still comply.

Table 34-263 is a comparison of the NEMA/UL/IEC enclosure specifications to be used as an approximate reference only. **Do not use the table to convert from IEC to NEMA designations.** For a definition of the ratings listed, see examples below and tables on **Page 34-217**.

Table 34-263. NEMA/UL/IEC Enclosure Type Cross-Reference — Approximate

NEMA Enclosure Rating	IP10	IP20	IP21	IP22	IP23	IP30	IP31	IP32	IP33	IP40	IP41	IP42	IP43	IP50	IP51	IP52	IP53	IP54	IP55	IP56	IP60	IP61	IP62	IP63	IP64	IP65	IP66	IP67	IP68
1	X	X	X	X	X																								
2	X	X	X	X	X																								
3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
3R	X	X	X	X	X	X	X	X																					
3S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
4X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6P	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
13	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			

Note: IEC 529 does not specify equivalents to NEMA Enclosure Types 7, 8, 9 or 10.

Table 34-264. IEC Environmental Enclosure Ratings — Examples of Designations

IP 4 4

Characteristic letters
1st characteristic numeral
(See **Table 34-265** Next Page)

2nd characteristic numeral
(See **Table 34-266** Next Page)

An enclosure with this designation is protected against the penetration of solid objects greater than 1.0 mm and against splashing water.

IP 2 3

Characteristic letters
1st characteristic numeral
(See **Table 34-265** Next Page)

2nd characteristic numeral
(See **Table 34-266** Next Page)

An enclosure with this designation is protected against the penetration of solid objects greater than 12 mm and against splashing water.

Index of Enclosure Ratings — IEC

Table 34-265. 1st Characteristic Numeral

Protected against contact and penetration of solid bodies.	
0	Not protected.
1	Protection against solid objects greater than 50 mm.
2	Protection against solid objects greater than 12 mm.
3	Protection against solid objects greater than 2.5 mm.
4	Protection against solid objects greater than 1.0 mm.
5	Dust protected.
6	Dust-tight.

Table 34-266. 2nd Characteristic Numeral

0	Not protected.
1	Protection against dripping water.
2	Protection against dripping water when tilted up to 15 degrees.
3	Protection against rain.
4	Protection against splashing water.
5	Protection against water jets.
6	Protection against heavy seas.
7	Protection against the effects of immersion.
8	Protection against submersion.

NEMA Definitions Pertaining to Non-hazardous Locations — NEMA Standard 250

Type 1

Enclosures are intended for indoor use, primarily to provide a degree of protection against contact with the enclosed equipment.

Type 3

Enclosures are intended for outdoor use, primarily to provide a degree of protection against windblown dust, rain, sleet and external ice formation.

Type 3R

Enclosures are intended for outdoor use, primarily to provide a degree of protection against falling rain, sleet and external ice formation.

Type 4

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against windblown dust and rain, splashing water and hose-directed water.

Type 4X

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against corrosion, windblown dust and rain, splashing water and hose-directed water.

Type 6

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during occasional temporary submersion at a limited depth.

Type 6P

Enclosures are intended for indoor or outdoor use, primarily to provide a degree of protection against the entry of water during prolonged submersion at a limited depth.

Type 12

Enclosures are intended for indoor use, primarily to provide a degree of protection against dust, falling dirt, and dripping non-corrosive liquids.

Type 13

Enclosures are intended for indoor use, primarily to provide a degree of protection against dust, spraying of water, oil and non-corrosive coolant.

NEC Definitions Pertaining to Hazardous Locations — Article 500

E51 Limit Switch Type Proximity Switches are rated for use in the following locations:

Class I Division 2, Groups A, B, C or D — Indoor Use

- For the definition of a Class I Division 2 location, see National Electrical Code Article 500-5, paragraph (b).
- For the definitions of Class I Group A, B, C, D Classifications, see the National Electrical Code Article 500-3, paragraph (a).

Class II Division 2, Groups F or G — Indoor Use

- For the definition of a Class II Division 2 location, see National Electrical Code Article 500-6, paragraph (b).
- For the definitions of Class II Group F and G Classifications, see the National Electrical Code Article 500-3, paragraph (b).

Class III Division 2 — Indoor Use

- For the definition of a Class III Division 2 location, see National Electrical Code Article 500-7, paragraph (b).
- For the definitions of Class III Classifications, see the National Electrical Code Article 500-7.